Actor & Avatar: A Scientific and Artistic Catalog

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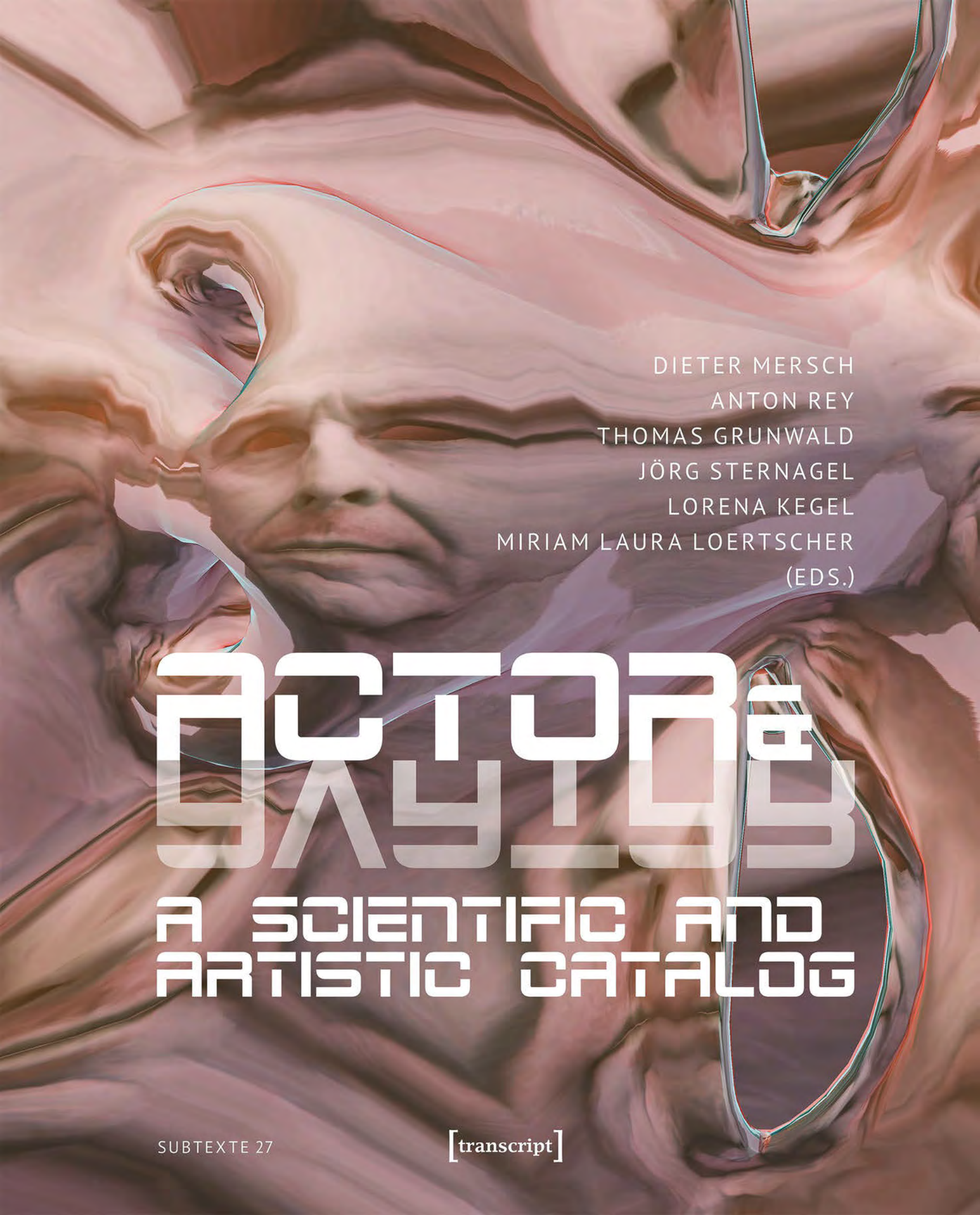

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ACTOR-BYTES

A SCIENTIFIC AND ARTISTIC CATALOG

SUBTEXTE 27

[transcript]

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Introduction

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This publication should be read as a workbook. It is conceived as a catalog without linear order, as a conglomeration of diverse texts and images that relate and react to one another in multivarious ways. Sometimes they contradict one another, but taken together, they are intended to trigger discussion about the multitude of experiences with actors, avatars, digital assistants, and other artificial beings bestowed upon us by new technologies. The images and texts seek to spur new approaches to scientific, artistic, and aesthetic engagement with such artificial beings, which includes animate technological artefacts with humanlike faces and gestures, androids and robots that, while perceptibly dissimilar to humans, are supposed to interact with us. We meet them with acceptance or reject and fear them. The contributions bring them into communication with people, and theatrical actors in particular, in order to study the social *relationships* between humans, machines, and their "descendants." The catalog draws on a longstanding collaboration between three very different research groups: the Institute for Theory and the Institute for Performing Arts and Film at the Zurich University of the Arts, which work with the aesthetics, forms, dramaturgy, and production of artificial scenarios, as well as the Swiss Epilepsy Clinic, which conducts neuroscientific research. In the run of the collaboration, all three partners pursued their own methodological strategies, from philosophy to approaches from artistic research and visualization techniques to EEG tests and fMRI scans. But all three were united in the goal of seeking to understand how humans react to artificial beings, and in particular the differences between encounters with human faces and encounters with artificially generated faces, such as those of avatars, animated actors, and the like. The catalog brings together the findings of this collaborative research. It also contains contributions from other partners, important reference texts, and further supplementary materials.

The research focused on how people perceive and cognitively process perceptions of real people and artificial artefacts and objects that represent people, whether it be in image form or by means of other visualizations, on the stage, in photorealistic paintings, and in film. The inquiry sought to uncover systematic, practical, and empirical evidence—or a lack thereof—about whether we perceive such representations differently than we do living people, especially when both only appear to us in images or recordings. In order to ensure that the different research projects were comparable with one another, they were limited to perceptions of faces. The key variables were actors who mimed certain facial expressions *perceived as signifying emotions,* and artificial beings like avatars that, by means of real-time motion capture, imitate the same expression. Facial recognition programs were used to scan the actors' faces and transform them into avatars. The programs included that of the Zurich start-up *Faceshift,* which was acquired by Apple during the course of the research, and *FaceRig* from Romania's Holotech Studios SRL.[1] The initial hypothesis was that human reactions to human faces, on the one hand, and to avatars, on the other, represent *distinct forms of relating* that do not just concern perception, but extend deep into the world of human emotions. In short, the assumption was that people register these impressions of faciality in disparate, incommensurable ways. If the hypothesis is correct, it would problematize, if not outright undermine the substitution theory of simulation, which holds that, given the necessary technological development, simulated beings can be perfected to such a degree that they appear indistinguishable to real persons and can actually be mistaken for such.[2]

One source of this foundational hypothesis was the widespread observation that we seem generally willing to accept or are mostly undisturbed by barbarity among artificial beings or animated characters in a way that does not hold when they occur between real people. Comics and cartoons depict all kinds of violence without shocking us. Indeed, we are often amused (as a defensive reaction) by them, even though these same acts would be unbearable if we witnessed them being committed by humans. Moreover, it seems that animation technology cannot completely or sufficiently model the eyes of artificial faces. The gaze, the windows of the "soul" are lacking, or at least are not convincing, because the eyes of the avatar are "looking at nothing," while the gravity of real humans' eyes consists in the fact they are always looking at "something" definite.[3] Similarly, the eye and

1 The research group ended up working with FaceRig. We would like to thank Holotech Studios for kindly giving us permission to use the program for research purposes.

2 On the simulation theory, the implausibility of which is discussed in further detail below, see Bostrom (2003).

3 On the phenomenological theory of the gaze see Sartre (1992), p. 340–400; Lacan (1978), p. 67–122; Waldenfels (1999), p. 124–147.

mouth cavities of avatars have no depth. They appear as just another surface receptive to all kinds of modifications and projections, such as pseudo-gazes or fake asymmetries between the eyes that come from nowhere and, as a result, remain expressionless. Thus, avatars are missing authentic facial features. Instead, they confront us with cyberfaces that are at once interfaces, which neither see nor conceal anything, but merely achieve visibility by being projected onto a screen.

Other similar intuitive points might help further underscore the plausibility of this difference. But they can only serve as guides to help researchers more precisely formulate their goals, questions, and empirical experiments. In this catalog, they provide starting points for philosophical, aesthetic, practical, and neuroscientific inquiries into why other humans affect us differently than avatars, robots, and the like ever could. We cannot avoid identifying with living beings, which might be one reason why their emotional expressions seem to evoke a different (emotional and affective) reaction in us than even the most accurate simulated expressions of artificially generated beings. This observation is all the more pressing in an era where the "media sphere" and technologized world cause us to interact more and more with quasi-autonomous characters, robots, automatons, and other artificial objects. This holds for theater, film, and computer games as well as for things like automated chatbots on the internet. The purpose of the interdisciplinary research presented in this catalog consists in employing diverse methods and, at the same time, analyzing the social, artistic, and cognitive consequences that such interactions have today and might have in the future.

FIG. 1
PROTOTYPE OF AN AVATAR.
HTTPS://FREE3D.COM/DE/3D-MODEL/HUMAN-MAN-SCAN-134MBODY-AVATAR-MARVELOUSDESIGNER-7701.HTML

To this end, the researchers intentionally brought concepts and methods normally considered incongruent into dialogue with one another. This involved combining approaches from phenomenology, cultural anthropology, and media philosophy with the production of images, practical settings, and performative experimental constellations at the Zurich University of the Arts' Immersive Arts Space, and, finally, the empirical experiments conducted with fMRI and EEG monitoring at the Swiss Epilepsy Clinic on subjects with and without epilepsy. In order to make the research of all three subprojects manageable and compatible, we decided to limit our work to the paradigm of "faciality," the emotional expressions of faces, and how they affect people. We chose as our primary object of study avatars as virtual-visual representations of people and, more specifically, avatars' "faces" and their algorithmic production. Thus, the research presented here analyzed all kinds of *images of faces* and humans' affective and emotional reactions to them. They include sequences of images of human faces expressing particular emotions as well as analogous sequences of avatars' faces that, like mirrors, were generated out of the human facial expressions. To sharpen our comparative perspective, each series was played through once by professional actors, by acting students, and by people with no training in acting.

However, this choice alone gave rise to complications with terminology. Is it possible to talk of "faces" in both cases? Do avatars have "faces" in an authentic sense or just the appearance of a face? With the aim of getting around this difficulty, the different research projects as well as the catalog distinguish between "face" (for the human face) and "visage" for the "faciality" of non-human artefacts. The etymological roots of the old German word for face, "Antlitz"—"*ante litze*"—signify that which looks at us, underscoring the significance of the gaze and the moment of an unfathomable alterity central to Emmanuel Levinas's philosophy. This alterity is, at the same time, connected to the aura of the human face, to its numinosity. In contrast, the duality of "visage" relevant for the singular oscillation between faciality and projection surface has more affinity with the Latin "*facies*" and is reminiscent of masks, grimaces, and "making faces." The terminological distinction thus has the advantage of avoiding confusion on the discursive level. This is all the more important because the research projects seek to study the potential for confusion in perception, particularly when it comes to images.

AN INTERDISCIPLINARY RESEARCH PROJECT

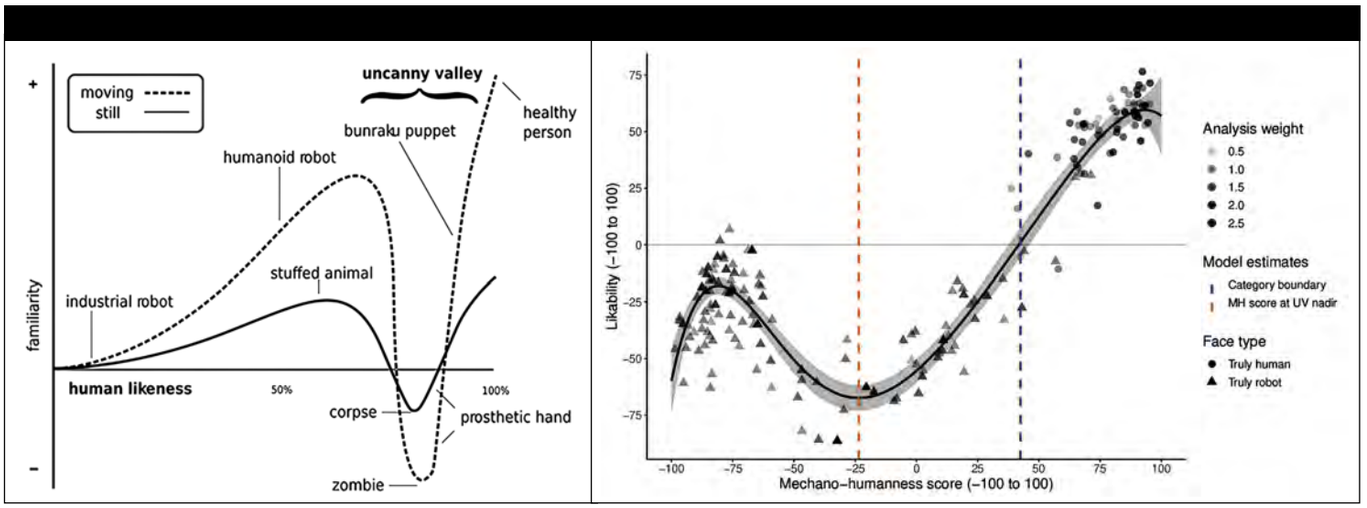
In this tightknit collaboration, three different disciplines shared their expertise with one another in order explore, in both theoretical reflection and empirical experiment, the hypothesis about the difference between how humans perceive other humans and how they perceive animate artificial artefacts. The *philosophical analyses* (Dieter Mersch, Jörg Sternagel) do not take Bruno Latour's actor-network theory as their starting point, even though this might have seemed like the obvious choice, since it focuses on networks of interlaced or overlapping relations. Rather, they work with phenomenological approaches that primarily address questions of *relating* and, in particular, the *relation between the face and the visages of avatars.* Special attention was paid to the role of the human gaze and the difference between embodiment and corporeality. Networks are based on the notion of symmetrical or egalitarian relations. However, one of the research group's primary hypotheses was the manifest *asymmetry of relations* between humans and other humans, on the one hand, and humans and artificial beings, on the other, an asymmetry exemplified by the difference between intentional looks and artificially animated eyes. Key literature here included the philosophy of Emmanuel Lévinas, who holds that the experience of the human face maintains an exceptional place in the experience of the other; Jean-Paul Sartre's account of "the look" in *Being and Nothingness;* Jacques Lacan's psychoanalysis of the gaze; and, on embodiment and corporeality, the work of Maurice Merleau-Ponty, Bernhard Waldenfels, Käte Meyer-Drawe, and Vivian Sobchack.

Some of the research group's core questions were: How do we perceive others? How do we recognize their "face"? What does it mean to be confronted with a "face" in distinction to the "modelled *facies"* or "visage" of an avatar? And what does it mean to express *oneself,* to make an expression, in contrast to imitating or simulating an expression? What are the critical aspects of this difference? Are avatar faces an analog of masks? In turn, how are masks different from simulacra? How do we develop a relation to either one? Do avatars just have *eyes without sight,* while the human gaze, as Lacan writes, has to be separated from the eye, because it represents an insistence in the imaginary that affects us, stalks us, and challenges us, an insistence that we cannot escape? What does the particular gravity of the human gaze consist in? From what does its force derive, and can it be artificially constructed? Further, are human bodily gestures "expression-laden," while avatars merely produce animated movements? Do they have a body with all of its expressiveness or just the formal contours of a corporeal entity? Can embodiment and its fullness be simulated—or do avatars and the like simply have similarities, representing a kind of "as-if" body? Does Helmut Plessner's distinction between "being body" and "having corporeality" play a role here? Is the innerness of "being body" constitutive for living persons, while artificial beings, dolls, avatars, and robots have, at best, a (grafted) exterior body? Finally, what does it really mean to maintain a relationship with something or someone different from ourselves? Does entering into a relationship always already mean entering into a social relation? Are not relationships—in contrast to relations—necessarily situated in a social context, so that we can only ever reconstruct them with *social and ethical categories?*

One of the group's primary hypotheses is that relationships of alterity constitute a special type of relation that is substantially distinct from relations to artificial beings, things, and other objects. Relationships of alterity are rooted in intersubjective acts of relating that are defined by concepts like alterity and foreignness, responsivity and passibility, witness, trust, and recognition. Something similar can be said of the processes of cooperation and communication essential for sociality. These processes do not just consist of abstract "inter-actions," an indifferent exchange of data, information flows, and other intentional structures; rather, they are always already founded upon an originary "respon-

siveness." Can these forms of relation be transferred to artificial beings without remainder, as some theories of post-humanism and media studies claim? Over the course of the research projects, it became clear that this problem has serious implications for paradigms significant to cultural and media studies, including actor-network theory (Bruno Latour), new materialism (Graham Harman, Tim Ingold, Timothy Morton, and others), and technological transhumanism, because the research question concerns nothing less than our relation to technology, which is constructed by our creativity, but which, as many have noted, has a tendency to overpower us and outstrip our ability to maintain control over it.

A particularly fruitful theoretical model for our inquiry was the "Uncanny Valley" (Mori 1970), a fictitious schema developed in 1970 by Japanese roboticist Masahiro Mori. According to the graph, artificial beings, animated dolls, robots, and other simulations and autonomous actors become more uncanny to us the more "humanlike" or realistic they appear. For Mori, uncanniness becomes more pronounced the more the humanoid objects are capable of moving on their own or articulating statements.



FIGS. 2 AND 3

SCHEMA FROM MASAHIRO MORI, "THE UNCANNY VALLEY," AND REPRESENTATION OF EMPIRICAL FINDINGS ON INDIVIDUAL PARAMETERS

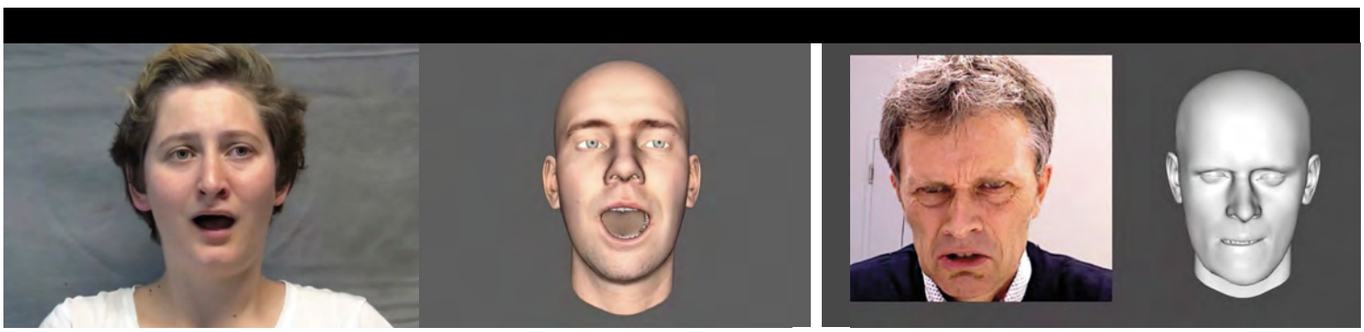
FROM MAYA B. MATHUR, FRANCESCA LUNARDI, BALAZS ACZEL, ET AL., "UNCANNY BUT NOT CONFUSING: MULTISITE STUDY OF PERCEPTUAL CATEGORY CONFUSION IN THE UNCANNY VALLEY," DOI:10.31219/OSF.IO/89SF4.

Of course, the model's utility requires distinguishing between visual media and "real life," but in general, it suggests that there is a fundamental incommensurability between people, on the one hand, and artificial beings, on the other—an incommensurability that cannot simply be ignored or circumvented. This necessitates that all-too realistic representations as well as fictional encounters with artificial beings in "real life" not transgress certain limits. Indeed, according to Mori, it is an ethical imperative of their design that they evidence a certain degree of dissimilarity with people. This notion seems especially applicable to artistic projects in which animated dolls or robots make explicit their "dollness" or "robotness" and thus inscribe a moment of distance or reflexivity into the relations that recipients might establish with them.

Nevertheless, it should not be forgotten that Mori's ruminations on the "Uncanny Valley" were heuristic in nature and were not based on empirical study. Since the publication of his article, numerous studies in cognitive psychology and the psychology of perception have both supported his claims and called them into question. In short, the "Uncanny Valley" is just a model, not a proof. Still, the schema is valuable precisely as a heuristic, which, as an unproven assertion, evokes a whole range of questions. The research projects

detailed in this catalog sought to contribute novel philosophical, artistic, and neuroscientific perspectives on this issue. Because if the project's key philosophical hypothesis that there is a hard distinction between humans' perception of human faces and avatar visages holds, it is to be expected that its effects can be observed in the regions of the brain responsible for facial perception. Moreover, multiple articles in this catalog engage with Mori's model in order to confirm, criticize, or further develop it and use it as a guide for fleshing out the difference between relating to human and avatar faces and analyzing its empirical and aesthetic effects.

The *aesthetic-artistic experiments* conducted in the mode of *artistic research* at the Institute for the Performing Arts and Film at the Zurich University of the Arts (Anton Rey, Gunter Lösel, Miriam Loertscher, Michel Weber) explored this and other issues through performative, dialogical studies of facial expressions made by actors and those made by avatars either modelled on the actors or directly manipulated by them. Thus, they implemented in practice what had remained hypothetical in theory. Alongside Faceshift, they worked with a number of programs like MSQRD, FaceApp, and Clip2Comic. Particularly interesting was their work with FaceRig, which enabled actors to play with avatars of themselves as if they were acting in front of a mirror and, at the same time, helped them establish a practical, reflexive experimental setting that provided optimized images for the neuroscientific researchers. The visualizations consisted of parallel images of actors making intense facial expressions for particular emotions like fear or joy alongside the avatar "visages" generated from them. These comparable images were then studied as part of the neuroscientific experiments. Physiological methods like pulse measurements and eye tracking were used to prepare the images. Their size, proportions, etc. were also standardized and digitally refined. Multiple model images were produced and selected for each set in order to obtain the best pictures for the subsequent neuroscientific experiments, which sought to identify variations in brain activity in reaction to the images.



FIGS. 4 AND 5

OWN IMAGES PRODUCED AS PART OF THE PROJECT

FROM INSTITUTE FOR THE PERFORMING ARTS AND FILM, ZURICH UNIVERSITY OF THE ARTS

The production of image sets was one part of the goal of creating reflexive self-encounters. Another was the performative, aesthetic, artistic constellation: actors mimed an emotion, saw themselves in real-time as an avatar, and at once controlled their own facial expressions and that of the avatar. For each round, they employed clearly distinguishable forms of expression. In a second series of images, they then selected the most neutral facial expressions possible. This should not be confused with "expressionlessness," since neutral expressions, too, evoke conscious or unconscious reactions from others, not to speak of the fact that neutrality is always indeterminate and can hint at a range of different dispositions, such as apathy, ignorance, or masked attraction or rejection. On the basis of numerous experimental exercises, the research groups produced video recordings and images of people and avatars with varying intensities and densities. Then, as if the images were being viewed through a mirror, the actors successively adjusted, improved, and made the expressions more precise and expressive. As a secondary effect, the procedure could be used to help train acting students improve their repertoire of expressions.

By engaging with "their own" "facial avatars," the actors tested out a form of theatre geared towards direct examination of experiences of others and of oneself. These experiments were then monitored with eye tracking technology and other physiological measurements.

From the very beginning, however, the uniform definition and typology of emotions and their physiological correlates in human facial expressions was an object of heated debate. The debate primarily concerned Paul Ekman's theory of the universality of certain emotions, their expression, and the ability of people—independent of culture—to recognize them. In a number of studies, Ekman identified at least six transcultural basic emotions that are embodied in characteristic expressive gestures: anger, joy, sadness, disgust, and surprise; an earlier list also contained contempt (Ekman 2007, 2009). But aren't emotions too fleeting to be definable? Is there ever an emotion that isn't already composed of a number of sometimes contradictory emotions? And can emotions be divided up into a vocabulary that can then, like a language, be channeled into complex "emotional claims"? Certainly, in everyday language, we distinguish between emotions like fear, joy, and melancholy, but when we are asked how we feel at a given moment, we often have difficulty pinning it down or get wrapped up in contradictions because too many impressions hit us at once. Indeed, emotions, which are always rooted in the body, are similar to a microscopic composite of antagonistic moods. They can always absorb different nuances or abruptly switch into their opposite, so that fear can simultaneously be felt as pleasure and sadness can be associated with the expectation that things are beginning to change. So, what is "an" emotion? The one-dimensional register of emotions put forward by Ekman (1972) is just as much of a theoretical fiction as the functional identification of emotion and facial expression undertaken by classical physiognomy and its reiteration in algorithmic "automated facial emotion recognition" programs (Weigel 2020). Emotions are hybrids: they can neither be precisely defined nor precisely comprehended. They fluctuate regularly. And in their simultaneity and fullness, they can neither be mastered nor totalized.

FIG. 6
EXPERIMENTAL FMRI SPACE AT THE EPILEPSY CENTER AT KLINIK LENGG, ZURICH

Nevertheless, we should not dismiss the fact that humans try to read the emotions of others immediately in their facial expressions. *What* a particular expression says is less significant than the difference between expressivity and neutrality. Actors, in turn, are concerned with *how* certain interpretations can be evoked. The experiment's design was thus intended to encompass and work with all these points. The images produced in the "avatarization experiments" reflected mimetic opposition. They were gradually edited and perfected such that they could be utilized as stimuli for the third part of the research project, the *empirical neuroscientific studies* (Thomas Grunwald, Peter Brugger, Hennric Jokeit, Lorena Kegel, Peter Hilfiker, Oona Kohnen, Martin Kurthen, and Teresa Sollfrank). The images of human "facial expressions" (actors) and digitally modelled, emotionally animated "expressive surfaces" (avatars) were systematically compared such that the brain activity triggered by viewing the different visual stimuli might provide data that would support the hypothesis that humans relate to the faces of other humans differently than they do to artificially generated faces.

Thus, each of the three disciplines began with situations that, though embedded in their fields, were comparable; their material and findings could be placed into relation with one another and discussed together. The empirical studies were conducted by means

of neuroimaging (fMRI) and EEG measurements on subjects with epilepsy and a control group without epilepsy. The experiment thus worked with two sets of overlapping variables: expressive versus neutral facial expressions and the responses of persons with epilepsy and without. The importance of the neuroscientific study should be neither overstated nor understated, because it only offers clues or traces, not solid evidence or proof. Still, the experiment was designed such that the results of the two groups would make it possible to draw inferences about whether epilepsy patients' reactions to strong emotions (fear) significantly differ from those of people without epilepsy.

Moreover, the simple, almost intuitive inquiry required that the three groups engage in extensive negotiations. They ranged from honing the common terminology—a *conditio sine qua non* for good collaboration—to gaining an understanding of one another's methods to agreeing on how the findings would be interpreted. Because of the project's interdisciplinary nature, the participants also had to agree on the limits of how the findings would be applied and the limits of the different perspectives. The preparation of precise stimuli was also a time-intensive undertaking. But in the end, the collaboration's research question, methods, and findings complemented one another very well.

METHOD, COLLABORATION AND TRANSFORMATION

Interestingly, the collaboration forced the researchers working on the philosophical part of the project at the Institute for Theory to expand the scope of their inquiry in various ways. Alongside the original question concerning the internal connection between *relationality and alterity* (comprised of the genuine ethics, passibility, and responsivity of social relations), other relevant aspects of the problem became visible over the course of the research. First and foremost was the aforementioned speculative hypothesis about the "uncanny valley" and the debates about it among cognitive psychologists that have been ongoing since the 2000s. Like the no less fictive "Turing Test" in research on artificial intelligence, the "uncanny valley" provides a useful evaluation metric for photorealistic visualization strategies in film, computer games, and various forms of virtual reality. While a machine's ability to pass the Turing Test (which, up to this point, has never happened) implies a certain indistinguishability between human and artificial intelligence—a possibility anticipated by the spectacular successes of Deep Blue and Alpha Go—the leap over the uncanny valley similarly represents a new level of visual illusion. Contemporary examples of this include deep fakes and the computer generation of faces of people who "do not exist," which are nearly impossible to differentiate from real human faces. The dangers summoned up by these technological advances, particularly for the social status of truth and falsehood, are clear.

FIG. 7

AI-GENERATED FACE OF A PERSON WHO "DOES NOT EXIST"

FROM HTTPS://THISPERSONDOESNOTEXIST.XYZ IMAGINED BY A GAN (GENERATIVE ADVERSARIAL NETWORK) STYLEGAN2 (DECEMBER 2019)

Another paradigmatic topic were so-called "real dolls." These life-sized, realistic "dolls for adults" offer a material occasion to probe, from the vantage of sexual fantasies, the rather abstract question about the difference between interhuman social relations and human-avatar interactions. Other humanoid "companions" confront us with similar issues, so that we can generally speak of a "dollification" of human relations in the era of the "technological other." Dollification denotes the reciprocal process in which dolls begin to resemble humans while humans begin to resemble dolls, a process facilitated by both plastic surgery as well as digital media

and their ability to create "hypermimetic designs." The "technological other" is a "dollified person" who has ideal proportions and assumes all the qualities of a "real doll." This led to a series of questions that concerned, on the one hand, both the conceptual distinction between dolls and robots—as artificial beings *with* bodies—and, on the other, between masks and avatars—forms of artificial "faciality." A central position came to be occupied by the inquiry into what constitutes a "face," what it induces, the extent to which it affects and challenges us, and the source of the deep significance of the cardinal medium of the mask in all cultures. Central, too, were reflections on the realistic presence of faces of people who "do not exist." Are there reliable attributes—too much symmetry, hollow eyes, and the like—that can help us distinguish between real faces and avatar surfaces, or is the situation more like the legend of Phidias, who created his ideal statues of gods by composing them of the most beautiful body parts of different people? On another note, what makes masks so unique? What gives them their special ritual energy and symbolic power?

The research on avatars touched on fundamental questions and conundrums in cultural anthropology. The projects sought to distinguish cultural figures like the doppelganger and literary subjects like that of Théophile Gautier's novel *Avatar* from the avatars of photorealistic computer games, whose virtuality derives primarily from algorithmic, binary constructions (Günzel 2012, Beil 2012). Ultimately, the analysis sought to reconstruct the history and structure of the "avatar," its uses, and its contemporary resurgence, which pointed us back to the notion that the avatar has an autochthonous place in "digital cultures." While this conclusion might stamp the avatar as an artificial product of mathematical-algorithmic simulations (Klevjer 2022), it also led to what we might call the "discontinuity thesis" of the philosophy of technology, which asserts that "digital figurations," AI-controlled robots, and other humanoid machines represent the dawn of a new era. This era's artificial beings mark a stark departure from their historical predecessors, such as the living statue Galatea, the Golem of the Old Testament, Mary Shelley's Frankenstein, as well as masks, dolls, puppets, and the like more generally. The essays in this catalog unfurl some of the consequences of these insights.

The *aesthetic-artistic method* of the Institute for the Performing Arts and Film at the Zurich University of the Arts draws on the techniques of *artistic research,* which considers art itself as a genuine medium of knowledge and knowledge production. Debates about the term "artistic research" and its multiple meanings have been ongoing for about thirty years. Clear, though, is that it should be seen neither as its own artistic genre nor as a unified method. For artistic research, art *as such* is a mode of research that makes its own singular contribution to the production of cultural knowledge, and this without the necessity of an interdependent exchange between the arts and sciences. Rather, dialogue between the arts and sciences arises only when both sides are granted equal standing and encounter one another on their own terms. The aesthetic-artistic part of interdisciplinary collaboration, in short, can only succeed when it pursues its own questions and goals. Guided by the same initial hypothesis, the research of the Institute for the Performing Arts and Film did not just focus on producing adequate, standardized images for the natural scientific part of the project. It also engaged with the question of what "expression" means, how it can be embodied by a face, and how it changes in real time. This helps explain the extensive experiments and the numerous prototypes generated through multiple takes, repetitions, adjustments, and edits. For their part, the prototypes themselves constitute aesthetic objects of their own genre. They functioned like mirrors that revealed how an emotion, whether it be fear or joy, can be expressed in a comprehensible fashion by the surface of an artificial figure. In turn, repeated engagement with them facilitated the classic work of dramaturgic mimesis. Thus, the experiment's set-up did not just consist in an automated real-time translation of actors' facial expressions into avatars. Rather, the ongoing process of improving both the actors' expressions and their avatars helped the researchers and participating actors develop a sense for what a certain expression *is* and *says*. This necessitated repeated performances and evaluations. Subjects—male and female actors—were carefully selected. They rehearsed a

range of expressions in a range of different situations and received help from a coach. Over 450 segments and sequences were produced and archived for the purpose of finding fitting cuts for the neuroscientific experiments. Simultaneously, the group created aesthetic installations that enabled actors to have, in almost therapeutic fashion, an encounter with their own avatar. Like theater more generally, this encounter, too, played with transformation. In this sense, the avatars enabled a ludification of the self. They opened a dialogue with identities whose theatrical aspect was at once a means of self-reflection.

A series of unexpected hurdles did trip up the group's work, however. This necessitated that participants regularly reconstruct and refine the experimental set-up. The production of convincing emotional expressions with a clear meaning with real-time translation into avatars was problematic because the uniqueness of the individual actors could not be subordinated to standardization and generalization. Moreover, skepticism about the universal validity of Ekman's catalog of basic emotions saw itself confirmed over the run of the research. There is no emotional expression that has just one meaning. This necessitated the "mirror" situations outlined above, which enabled the actors to reflect on, relate to, and observe themselves. The team then got the idea of using similar techniques for rehearsals and actor training. One reason was that the confusion of identity and otherness in encounters with the avatar version of oneself and its "face" helped actors develop a feeling for how they themselves made expressive gestures. Finally, online surveys allowed the researchers to collect and analyze data, even though, for reasons of experimental validity, the questions were limited to emotions like sadness, joy, and fear, which forced the team to return to Ekman's categories.

Another complication derived from the fact that expressions can be interpreted in multiple ways. The researchers paid particular attention to differences in how recipients viewed and were affected by the images of actors and those of the digitally generated avatars with their artificial gestures and expressions, which play an important role in animated films, computer games, and film presentations. In order to tackle the issue of how people relate differently to human faces and avatar visages, the researchers studied the limits and possibilities of interactions between living people and avatars by using motion-capture technology. This provided a practical test of the initial hypothesis that went beyond the experiment with the non-moving images, thus significantly widening its scope. One important finding was that *movement* is an essential component of the *affective legibility* of emotional expressions. Emotions and their communicability are not a function of frozen facial expressions, but of animation. Emotional expression is a highly fluid event, a transition. The insight led to the hypothesis that avatars—in contrast to the experience of the actor's "face"—derive their attraction primarily from their movements and not from what we would call facial expressions, because their surface visage is relatively schematic and does not "see anything." Certain features of the actor's face like their eyes, eyebrows, and the position of both can indeed be modelled without issue. However, their gaze cannot be modelled any more than folds and wrinkles can be used to generate an accurate representation of an actor's face. But, then, can we really say that avatars have an expression at all? Sure, their features give them "character," but this character does not have a personality with its own history. Some of the contributions in this catalog engage in more detail with this and other differences.

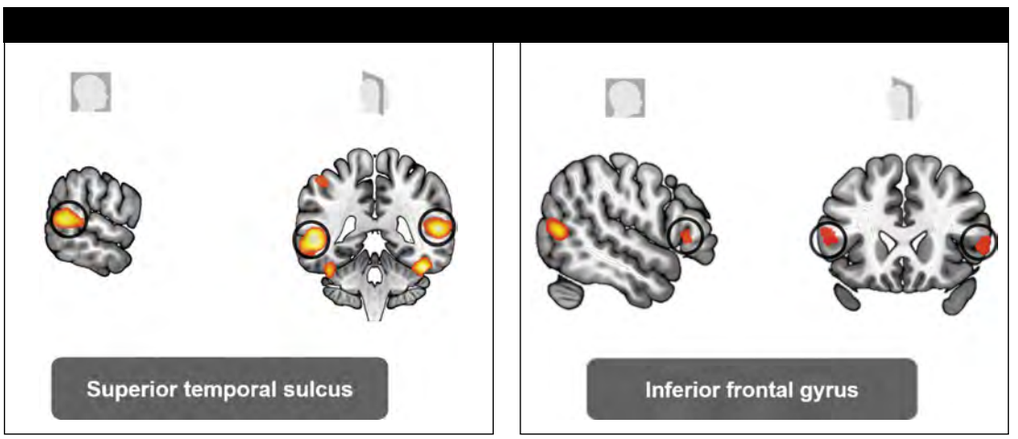
A byproduct of the group's practical aesthetic research was a series of statements about the qualities of artificial beings and their deficiencies, which, despite the advances in photorealistic technology, stick to the artefacts and undermine their effectiveness. For their part, these insights were highly relevant for the philosophical section of the project. They might be provisionally summed up by saying that the difference between human "faces" and artificial "surfaces" derives first and foremost from the "holes" that define the face, as Gilles Deleuze and Félix Guattari write in *A Thousand Plateaus* (1987, 167–191). Bodily orifices, as negative spaces, play an essential role in facial expressions. Simulating them is difficult, because the absence marks the limits of simulation, the point where there is literally *nothing*

FIG. 8
NEUTRAL FACIAL EXPRESSION AVATAR PRODUCED AS PART OF THE PROJECT'S RESEARCH.
FROM INSTITUTE FOR THE PERFORMING ARTS AND FILM, ZURICH UNIVERSITY OF THE ARTS

to simulate. Thus, it is the "empty" or "unfilled" cavities in human "faces" that, in avatar form, simply become black surfaces that mark the places where the inside "turns" outward and forge a connection between subjectivity, expression, consciousness, and comprehensibility. Because the eye is the focus of attention, just as the mouth is the site of articulation. Both gain their significance from the impossibility of representing them, precisely because they are not the product of projection or a screen. Rather, they are the product of a depth that necessarily remains abyssal.

Standardized visual representations of the expressions of human "faces" (actors) and their avatar counterparts served as the foundation for the *empirical, neuroscientific experiments* at the Swiss Epilepsy Clinic. They worked with tools with high *spatial* (fMRI) and *temporal* (EEG) sensitivity in order to detect differences, first, in how people process very pronounced facial expressions (of fear) in contrast to neutral facial expressions and, second, in how people process human faces in contrast to nonhuman visages. Data was collected from two groups: a group of patients with temporal lobe epilepsy (TLE) and a control group of subjects without epilepsy. Comparisons between the two data sets aimed at uncovering significant influences of TLE on emotional cognition. Guiding the inquiry was the question as to whether there were significant differences in emotional perception and the associated activation of certain regions of the brain when subjects saw human and nonhuman stimuli and when they saw their own face and its avatar version. In other words, the analysis sought to disclose whether humans react differently to human "faces" than to simulated expressions of the "visages" of artificial beings. One sign of such difference would be the identification of discrepancies in the brain activity of subjects with epilepsy and those without. The analysis primarily homed in on the degree of difference in reactions to clear facial expressions with a very strong emotional or affective dimension. Comparative studies on patients with autism and schizophrenia had already suggested that such differences exist.

The empirical researchers worked closely with those producing the images of actors and their digital avatars. Out of 468 possible sequences, they selected 128 video segments and then edited them for the purposes of the EEG and fMRI tests. They also put together an online questionnaire where test subjects could enter their assessments of how they experienced the intensity of human and computer-generated faces. Finally, they conducted 56 tests with people with and without epilepsy. Three lines of questioning informed the study. First, which regions of the brain indicate differing activities between the dynamics of human emotional expression and those simulated by avatars? Second, do patients with temporal lobe epilepsy show any difficulties in perceiving and recognizing the visible expressions of humans and avatars? And third, what consequences should be drawn from this for the design and application of such avatars that have different neurological effects on epilepsy patients and the control group? On all three questions, both studies (fMRI and EEG) led to promising findings that were published in the peer-reviewed journals *Social Cognitive and Affective Neuroscience* and *Frontiers in Neuroscience* (Kegel et al. 2020, Sollfrank et al. 2021). This catalog contains a summary of the most important results.



FIGS. 9 AND 10

RESPONSIVE BRAIN REGIONS IN FMRI.

FROM THE EPILEPSY CENTER AT KLINIK LENGG, ZURICH.

RESULTS AND INTERPRETATIONS

The three groups did indeed work with different perspectives and aims, but the research project's interdisciplinary design with its various methods and fields of expertise forged a complex, three-dimensional system that converged in theoretical, aesthetic, and empirical insights on the fundamental differences in how people interact with other humans and with avatars. Special focus was placed on precisely defining the limits of each subproject's scope and, by extension, on relativizing the reach of the individual contributions, whose most fruitful conclusions were born out of their interconnections with one another. Thus, the *philosophical* research of the Institute for Theory, with its emphasis on the aesthetics of relationality, initially accomplished little more than refining questions, defining concepts, drawing comparisons, and repeatedly hitting on the key difference between "face" (actor) and "visage" (avatar). On the theoretical level, this difference—and really, determining this was the decisive point—lined up an indissoluble structure of binary relations between human and non-human, living and artificial, reality and possibility, and being and appearance or "as" and "as if." The deconstruction of these differences by media and cultural studies only touches on the reasoning behind them. However, they remain intact for pragmatic purposes and for everyday life. They structure social experience and cannot, despite skeptical analysis, be simply skipped over. Reducing them to a network of relations and smoothing them out into a series of distinctions without difference in which humans and non-humans hold the same status constitutes one of the post-humanist misunderstandings that obscure contemporary discourse. Not only are they driven by a manifest confusion of "difference" with "dichotomy." Even more, each dissolution of oppositions leads to obvious contradictions, the least of which is the supposed indistinguishability between human and technological traits, though the latter are themselves a human construct. Of greater significance, however, are hypostatizations of deconstruction. Deconstruction speaks not of *factual* indifference, but, at the most, of the impossibility of grounding strict separations; it only points out potential overlaps between the opposed terms, not the inexistence of differences as such. That these differences remain indispensable is evidenced by the *terminological distinction between relationship and relation,* which was foundational for the entire research project. While relationship denotes human connections that always involve interdependencies and mutual recognition in a context of structural asymmetries, relations describe formal classifications and mappings. Alterity is the primary component of human relationships. The same does not hold for confrontations with artificial objects, technological artefacts, and other constructs for the simple reason that alterity cannot be programmed. Where relationships are equated with relations and thus become exchangeable and substitutable, our conception of the social is hollowed out.

Moreover, avatars are simulated beings without *persona* and thus without *agency.* In the cases where they seem to have a persona, it is, in the best-case scenario, simulated. Simulations are based on algorithms or mathematical functions, in which all decisions are determined by preprogrammed formulas. The same holds for their alleged agency. They do not act with intentions, but only behave according to binary choices and aleatoric processes. Thus, the most they are capable of is generating similarities. *But similarity is different from equality.* In contrast, assuming that human agents are on equal footing with algorithmic actions diminishes the reality of the social and reduces humanity to an algorithm. And in so doing, it preemptively settles the ongoing debate in philosophy, the social sciences, computer science, the study of cognition, and cultural and media studies about human and artificial intelligence, on the distinction between thinking and computation and the mathematical coding of consciousness in favor of the universality of the digital.[4] Positing equal encounters between humans and avatars, which can only be normal in dystopian science-fiction novels

4 See the critical perspective in Betancourt (2020).

and films, implicitly accepts the so-called simulation hypothesis, which has been analyzed in particular detail by Nick Bostom (2003). The hypothesis holds that it is possible that our lives and experiences, our ideas and creations are nothing but simulations generated by some supercomputer built by a higher civilization than our own, nullifying the difference between "us" and technological artefacts. People like Elon Musk have embraced this idea as having a probability of more than one in a billion. However, there are many reasons why it is not just unsustainable, but simply absurd, because it not only lacks all sense of the social—its genuine *koinonia*—but also all sense of what consciousness and thinking are, which are always consciousness of consciousness and thinking of thinking in the mode of the double genitive. This also jettisons the meaning of freedom and action as well as what it means to exist as a human with desires, inadequacies, and shortcomings—and thus the need to have creativity, art, and philosophy.

But the simulation hypothesis is also wrong for mathematical reasons, because it necessitates not only the simulation of nearly ten billion individual human brains and bodies, but also their many interactions with one another, including all their recursive simulations and meta-states. The sheer calculation of it all would exceed the possibilities of the universe (the capacity would not only demand the simulation of "A," but also all of its potentialities, which would propel the necessary actions into the exponential).[5] If we were just simulated beings that only ever encountered other simulated beings, then we would live in a completely different world with a bunch of reductive descriptions and categories. One of the goals of the philosophical section of the *Actor & Avatar* project was, to an extent, to rescue the *indispensability of classical philosophical distinctions* as a countermeasure to their almost bizarre dissolution. The idea was not to reinstitute the old hierarchical order of metaphysics, but to make clear that *without them,* we cannot meaningfully talk about ourselves, our own environment, our sociality, and our "community" with technological artefacts and other things or creatures. It follows that, *as* distinctions, they have the status of *conditiones sine quibus non,* not more, but also not less.

FIG. 11
AVATAR: THE WAY OF WATER (2022)
© DISNEY

No less mistaken is the "constructivist theory" favored by some researchers in cultural studies. The theory holds that all perception and cultural life forms are constructed; in doing so, it has some affinities with the simulation hypothesis. For its part, though, it is not outright wrong, but it is one-sided, because it is forced to maintain the non-constructedness of materiality as the condition of all construction. After all, something that is constructed has to originate in something else that is itself not constructed. Otherwise, one falls into the same kind of recursion problem as with the simulation hypothesis or into an infinite regression. Where construction dominates too much, there is nothing that makes construction possible. The necessity of presupposing the existence of something non-constructed also maintains for intersubjective relationships, which can never entirely be a product of relational modelling, but instead are always determined by the relata and where the relation

5 On the opposite position, see Manzotii, Smart (2016).

stems from. This is the reason for the project's emphasis on the duality of "relationships" and "traits," which underscore that the social is defined by its passivity. Every construction is the production of *poiēsis* and thus of an *actio* that collides with the *passio* of the social, because the passive cannot be deduced from the active.

Alongside such questions of scope and validity, problems of representation and its limits also played a central role in the research project. They were explored by using the example of avatars in order to draw broader conclusions, which can be applied not only to visual media and strategies, but also to digital, algorithmic, and performative forms of shaping, function, and control more generally. The fundamental impossibility of totalizing human experience as a *social a priori* and the limits of its methodological and medial possibilities stood front and center. The inquiry into how people encounter and comprehend artificial beings, and in particular robots and avatars, served as points of comparison for developing insights into mimesis in theater, film, computer games, graphic novels, and anime.

Some segments of post-humanist discourse and cultural and media studies assert that there is no substantial difference between human and non-human agents. The philosophical section of the current project determined that this claim chronically ignores the essential asymmetry and passivity of affects in social relations with others, while unduly valorizing the experience of "other Others" in hyper-mimetic simulations. In contrast, the collaborative research found that artificial beings *must be treated as fundamentally different* from living persons, acknowledging that they can only ever be "similar" to humans, but never *equal or equivalent* to humans. In short, interacting with artificial beings is always defined by a deficient similarity. This point is illustrated poignantly by lifelike "real dolls," which, as extreme embodiments of avatars, gradually gained in significance over the course of the project. The interdisciplinary research thus rejected the supposed radicality of post-humanist theories. Decisive are *forms of relationship and their consequences,* because *social interactions between humans* are fundamentally different from those between humans and artefacts, technologies, and animated beings, since the latter are founded in the former. Decisive, thus, is to carefully analyze the specificities of this difference and the reasons behind it. This also holds for objects entangled with affects, such as dolls. The heuristic assumption of the *primacy of social relationships* thus occasioned the group to study interhuman forms of relating with more nuance than in most work in cultural, media, and art studies (actor-network theory, media ecologies, etc.). The real challenge posed by the philosophical part of the collaboration consists in the repeated reminder that our relationships with people are distinct from those with things and artificial agents, and that social communication (in the sense of getting a response) means something different than a mere algorithmic exchange with artistic figures modelled on technological operations. The purpose of this insistence was not to rehash the anthropological discussion on the chasm between humans and technology—this would be pointless, since technology itself is a human construct. Rather, the idea was to delineate criteria for the still valid distinction by separating social relationalities from other forms of relation.

Over the run of the research, this project and its conceptual concretization found support in the promising findings of the *neuroscientific experiments* conducted at the Swiss Epilepsy Clinic. Further research is certainly necessary, because the experiments were focused on a narrow question and could only offer fragmentary evidence. Nevertheless, the experiments on strong facial expressions—and particularly those conducted with fMRI—came to the by no means obvious positive conclusion that there are both similarities and differences in the ways that people process human "faces" and avatars' "visages." It would be going too far to view this as confirmation of the project's initial hypothesis. Still, that the findings do suggest a significant difference is in itself interesting. In comparison to neutral facial expressions, those expressing fear made by both humans and avatars more strongly activated, in subjects without epilepsy, the inferior occipital gyrus, the ventromedial prefrontal cortex, the temporal lobe, and the left amygdala (and in the processing of human facial expressions the right amygdala, too); in subjects with epilepsy, the activation

was less pronounced. For their part, neutral facial expressions performed by both humans and avatars elicited roughly similar brain activity, especially in subjects without epilepsy. These striking differences between how the perception and processing of human and artificial facial expressions activate the brain appeared when subjects were confronted with explicit expressions. Differences were especially notable in the anterior and posterior cingulate cortexes, the anterior insula, in the anterior and posterior superior temporal sulcus, and in the inferior frontal gyrus.

Beyond that, the clinical fMRI tests revealed differences in neurophysiological processing of facial expressions in persons with epilepsy and those without. While facial expressions of fear, in contrast to neutral facial expressions, normally activated the right amygdala and the left superior temporal sulcus in the control group, the brain activity of patients with temporal lobe epilepsy appeared reduced. The reduced brain activity was identifiable in the mesial prefrontal cortex, the superior temporal sulcus, and the inferior frontal gyrus. These findings underscore the clinical significance of temporal lobe epilepsy for the processing of emotional expressions and provide data that should be considered in future clinical studies on how humans process facial expressions made by other humans and by artificial beings.

In EEG studies of subjects without epilepsy, the event-related potential (ERP) in the timeframe of 300 milliseconds after the stimulus presentation demonstrated a significant difference between the "visages" of avatars and human faces. In particular, the amplitude of negative components was higher at 300 milliseconds after exposure for human expressions of fear in contrast with neutral expressions, while the amplitude of positive components was higher at 500 milliseconds after exposure for both expressions of fear and neutral expressions made by avatar "visages." This suggests that human faces might cause a stronger initial arousal than non-human "visages," while avatars' "visages" are associated with a more delayed, stronger, potentially negative emotional reaction. However, a significant difference in responses to facial expressions of fear and neutral facial expressions in both timeframes only maintained for human faces, but not for artificial faces.

The analysis of oscillations in the electrical activity of healthy subjects' brains determined that all faces/visages (neutral and fearful, of humans and of avatars) triggered an increase in activity in the form of a desynchronization of oscillations in alpha brain waves. Still, all values of responses to the neutral expressions of avatars were significantly greater than those for "emotionless" human faces. This might suggest that all stimuli have to be processed just because they attract the subject's attention. Underlying this is the assumption that increased synchronization of theta brain waves is associated with an increase in cognitive processing and memory activities. The data supports the claim that an increase in theta wave synchronization, which is correlated with a greater expenditure of resources, is caused by facial expressions of fear, regardless of whether they stem from human faces or artificial "visages," while neutral facial expressions do not evoke such synchronization. On this particular point, different responses aligned with face type were only observed in response to neutral facial expressions. This suggests that processing the impulses given off by avatar "faces" requires more resources than with human faces, while facial expressions of fear, regardless of their source, might max out the brain's capacities, so that the different type of face carries little weight. In sum, the fMRI and EEG data underscore two points: First, there are differences in how our brains process human faces and artificial "visages"—at least in the case of strong facial expressions. Second, on the level of methodology, they show that the measurements used can generate meaningful insights about how people process human faces, artificial "visages," and the facial expressions of both. This might help future research develop better methods to more precisely analyze the effects of epilepsy on emotional and social cognition. The studies and their findings can be found in this catalog.

Thus, we are confronted with a striking congruence between the results of the philosophical inquiry and the neuroscientific empirical research—even if we can only treat these congruencies as "clues," since the cooperation of philosophy and empirical science cannot extend further than that. The *aesthetic-artistic research* of the group at the Institute for the

Performing Arts and Film opened up another perspective. One aspect was its experimental method of creating visual stimuli for the neuroscientific studies through repeated takes, rehearsals, and recalibrations. This represented a considerable effort and more reflexive sensitivity than is normally the case with empirical studies, which generally work with material that is more or less given. Moreover, together with the Immersive Art Spaces of the Zurich University of the Arts, the group conducted its own studies on the *experimental practice of self-encounters*. After all, translating their own expressions into avatars required the actors to continuously "work" on their own faciality—not only on how they made certain expressions, such as those of fear, joy, or neutrality, but also on their sense of self as such. While the philosophical working group identified interactions with human faces in contrast with avatar faces as an insurmountable difference, the aesthetic-artistic research group played with this experience and experimented with "overcoming" it. Aesthetics and art primarily work not with realities, but with possibilities. This is decisive for the future of artistic practice in theater, film, and, more and more, interdisciplinary art, because these forms' experimental spaces create their own experiential frameworks that have always engaged with the problem of encountering oneself.

FIG. 12

JOHANNES GUMPP, SELF-PORTRAIT

1646, FLORENCE, THE UFFIZI GALLERY

While artists have historically always used mirrors for their self-portraits (see Kruse 2008), today's digital technologies create "other mirrors" that have more to do with "doppelgangers" and the free, artistic shaping thereof. Virtual encounters with one's own "face" in an image are made possible by techniques like animating or altering it, or by motion-capture systems and other three-dimensional virtualization programs like those used in film studios. These encounters give actors the opportunity to experiment with their own identity, to double or distort themselves, in order to spur communicative processes that not only reveal the potentials of avatars, but also make visible the differences in how people relate to other humans and to artificial beings. These differences, of course, stand at the center of the collaborative research project. But this section focused less on the nature of this difference and its ethical consequences and more on art's "joyful play" with transformation, which has been part of its practice since Dionysian theater. After all, the archetypal god Dionysus originally stood less for intoxication and revelry in pleasure—these were later additions to his meaning—and more for *metamorphosis* and *masks*. Thus, the inquiry into the use of avatars in digital theater was also an inquiry into its relation to the classic mask. It is this desire for "becoming other" that generates its own experiences, knowledge, and perhaps even "fear" (see Aristotle), which has its own reflexive dimension that exceeds mere pleasure. The social relevance of art and the modes of research enabled by it have their own singular, unmistakable power. Beyond the

FIG. 13

KYLIX WITH DIONYSUS WITH THYRSUS AND VINE BRANCH BY MAKRON, CIRCA 480 BC.

FROM THE GODS OF THE GREEKS, BY E. SIMON, 2021.

visualizations produced for the neuroscientific experiments, the rich collection of images of faces and their various avatarizations represent artificially induced moments of "becoming other" that could be studied from other, art-specific vantage points. The current catalog documents not just a selection of the images and their experimental use. Multiple contributions also deal with the aesthetic productivity of the various playful interactions between "actors" and "avatars."

PRODUCTION OF THE CATALOG AND THANKS

We would like to thank the many people who helped put together this catalog. First, we want to thank the Swiss National Science Foundation, whose generous funding made the collaborative interdisciplinary research project possible. We also want to thank all the members of the three research groups, as well as the many others who supported, enriched, and pushed forth the research with their ideas, reflections, and critique, including Hennric Jokeit, Peter Brugger, Martin Kurthen, and Peter Hilfiker, Gunter Lösel, Marius Mahler and Oona Kohnen. International partners played a key role in this project. Thank you to: Alexander Gerner from the University of Lisbon, Stephan Günzel from the Technical University of Berlin, Michael Mayer from the Sinergia group at the Zurich University of the Arts, Corinne Soland, Martin Fröhlich and Christian Iseli of the Immersive Arts Space at Zurich University of the Arts, Nadja Ben Khelifa of the Freie Universität Berlin, James Tobias at UCR, Allison de Fren at Occidental College, Los Angeles, and photographer Elena Dorfman. We were grateful that many other authors participated in the discussion, among them Martina Heßler of the Technical University of Darmstadt, Rune Klevjer of the University of Bergen, Käte Meyer-Drawe, professor emeritus at the Ruhr-Universität Bochum and Gabrielle A. Hezekiah of the University of British Columbia. All their contributions made possible this rich compendium full of heterogeneous ideas and materials, which can be read against the grain or out of order and further developed on their own terms or on in conjunction with other approaches. Alongside selected test images and figures on their experimental production, it also contains images from art and design, which were a source of inspiration for the research groups in different ways. It contains texts, essays, and brief studies composed by members of the research groups and by guest authors and cooperation partners. Finally, it contains many documents and extracts from literature and texts published elsewhere. They all revolve around the research topic in a broad sense. They offer a range of perspectives on the same subject and open up a discursive field that invites readers to continue the work in different ways. Some complement or overlap with one another, while others explicitly contradict one another. But above all, they diverge in their forms, which range from academic articles, such as the reports on the findings of neuroscientific experiments, to artistic pieces on the "experience of oneself with one's avatar," which gained significance as a tool of actor training, to essays that stand on their own. We thus hope that readers will treat the catalog as a diverse assemblage that is not so concerned with delivering complete answers as it is with articulating new questions, engaging in reflection, discussion, and experiment, and perhaps spurring other disciplines to develop their own inquiries into these issues.

For all translations from German into English, we are grateful to Laura Radosh.

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Avatars

THE AVATAR

DIETER MERSCH

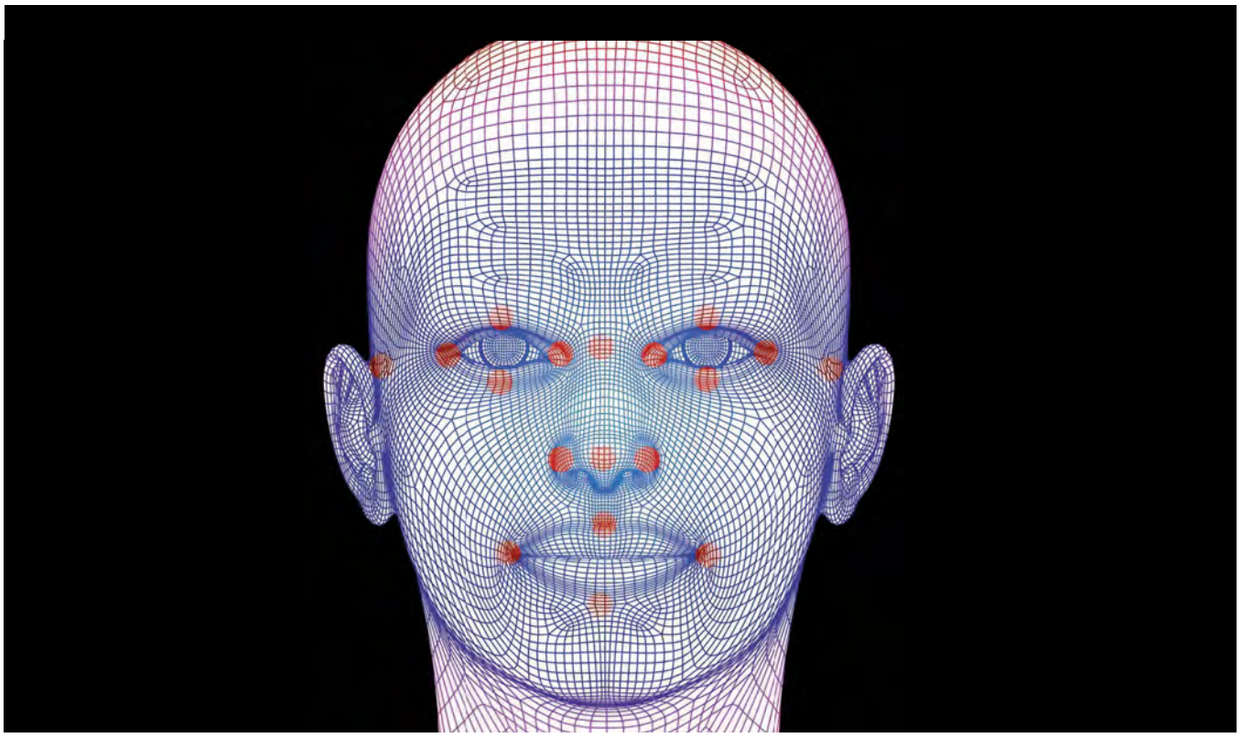

FIG. 1
THE AVATAR. A LINEAR MATHEMATICAL MODEL

The original "avatars" were intermediaries or messengers in Indian mythology, comparable perhaps to Hermes in Greek mythology. Heralds, they mediated between gods and humans, between immortals and mortals, for the latter did not understand the symbols of the former. The Hindu term—from Sanskrit, अवतार, avatāra—stresses the "descent" from the divine to the human, not in the sense of a fall, but in the sense of an emanation or transitionary figure. It denotes the transformation of the highest Brahma into the shape of a person or animal. The avatāra is on the one hand the divine power incarnate in the "soul" of all that lives, on the other hand it is the temporal evolution of the divine throughout the order of the world and its eras: the transition from the Treta Yuga (silver age) to the Dvarpa Yuga (Bronze Age) to the Kali Yuga, the present. Although texts on Vishnu sometimes distinguish between ten avatāri stages, ending with Kali Yuga, the great purification, analogous to Revelations in Christianity, others see this as a misinterpretation, because all ages must be regarded as coequals.

In his 1856 short story *Avatar,* an appropriation of the Indian Veden, other holy Indian texts, and other obscure doctrines of salvation as is characteristic of nineteenth-century European philosophy, Théosphile Gautier tells the fantastic tale of Octave de Saville, whose body is slowly being eaten up from within (Gautier 2011). A dialogue begins between

de Saville and a mysterious healer regarding the illness of the Occident and possible salvation by the gods of India, whom in *Avatar* were for the first time accorded a central position in European literature. It is also a story of wandering souls, of body switching and stand-ins, foreshadowing that which digital avatars of the gaming age in particular are supposed to do, as well as virtual assistants on the web that act as mediators between people, machines, and information media: the substitution of subjectivity. They are meant to replace the user's corporeality and intentionality with an "all-knowing" (as far as computable functions are concerned) simulation that has been freed of all material restrictions.

In 1992, Neal Stephenson popularized the technical adaptation of the avatar in his science fiction novel, *Snow Crash.* However it is important to distinguish between the mythological *avataris* and its artificial, technological counterpart. While the former acts as a religious metaphor for a transformation, the latter are design objects, graphic surfaces, or diagrams in a 3-D environment that were created by algorithms. They are completely different from classic tools, and also from mathematical surrogates of a persona. They are instead image-agents *(Bildagenten)* that exist in a universe that is entirely iconically defined. Their configuration equips them with characteristics that follow a logic of decision making that they can, within the framework of their program, navigate to hold conversations or chat on certain subjects or take on a number of everyday functions that can be useful for the operation of computers, technical systems, and internet communication. However, dematerialized figures, they can only exist in virtual Euclidean spaces. They also exhibit a strange indifference to their co-avatars. Asocial at their core, they are completely focused on their user. Increasingly, they are equipped with artificial intelligence, advancing to become automata able to execute processes on their own and make autonomous decisions regarding specific tasks such as translation.

It is possible, and also plausible, to characterize them as prostheses, in the sense of Marshall McLuhan's theory of extensions, but with the caveat that they do not extend our corporeality, but rather our actions and our wills into our monitors (Beil 2012). One can also, equally plausibly, see them in the framework of actor-network-theory as actors in a network of other actors, so that they form 3-D models of artificial Others, which interact with us, intervene in our environment, or substitute for us and take over social functions without themselves being social. They are like abstract Others without alterity.

They have been called "virtual bodies," (Klevjer 2006) "digital doubles," (Gunkel 2010) "puppet Homunculi" (Apter 2008) or posthuman "agents" that are beyond any differentiation between human and non-human. Like "desiring-machines," they conjure a dialogicity or proximity that is in the process of appropriating our powers of speech and expression, of understanding our mimicry and gestures, and in doing so shifting the meaning of both humanity and sociality.[1]

At the same time they are nothing other than images or icons in a limited virtual environment in which—it should never be forgotten—everything has been programmed. When we speak of "interaction," it must be remembered that this takes place without exception in the imaginary realm. We enter into contact with them as images in images, lending them autonomy and meaning, and sometimes even faked identities, like animated characters in a film or figures in a novel. Mystifications that see them as fully valid techno-phenomenological Others with their own personalities or as elements of a complex techno-social future are at best misleading. This is best illustrated by James Cameron's 2009 movie *Avatar,* which features two kinds of actors, digitalized actors who play "avatars" or people who turned themselves into "avatars" with the help of a transformation machine, and artificially animated figures. The two different figures illicit different reactions from the audience, in which no one, despite 3-D cinematography, believed the illusion that they acted on the same plane.

1 On desiring-machines see Deleuze and Guattari (1983). See also Harroll and Lim (2017).

The more important concept behind the design of technological avatars is the creation of virtual artifacts that make it easier for us to deal with the opacity of digital environments and allow us to move in mathematical environments in a similar manner as we do in our daily surroundings. They are therefore programmed to "learn" and "remember" or to "show emotions" and hence develop their own "personality," which is, however, as cybernetic as algorithmic storage and self-modification via feedback loops. In order to understand their "work," performance, and range it is necessary to take into consideration that their technical/mathematical construction as well as their digital milieu have a purely simulative character. Their only perhaps non-simulative element is that they emulate theories about human lifeworlds. The scope of their freedom is limited, just as these theories are subject to the scientific restrictions of their times, which reveal nothing but historical prejudices.

Avater "worlds" thus remain in the modus of *as if.* Their entire reality is appearance and similarity, including *mimesis* or adaptation, so that we are dealing with superficialities based on 'looking like' that imitate us or provide a historical snapshot of our being, but always miss their mark. Avatars, to put it another way, are first and foremost mathematical constructs made to engage with us in mathematical spaces that are likenesses of models of how we currently view our world. Their precondition is both the model and the modeling of these spaces, which have already quasi distorted and deformed the space of the real. In no way are these spaces identical with the environment we encounter, and even less so with the ambiguity and confusion of social worlds. Rather they are patterns of ordered structures, like an algebra placed over myriad fluctuations and spontaneously changing singularities. They make an attempt at equality but are more like maps lain over a landscape in an attempt to cover it. Even if the maps covered every point of the landscape, they would remain maps, for landscapes contain points no more than faces do "landmarks" that can be recognized or imitated. For this reason, the outward form of avatars as well as that which they do or attempt to express can never be more than a homology. They are imitations that are no more than imitations of imitations, because they are images that act in a world of imagery, like actors who impersonate a reality that is itself an act, so that it can function as a milieu shared by them and human actors.

Characteristics are faked on both sides: that of the avatars and their expressions and actions, and that of the environment, which only approaches human environments when it remains closed by a homomorphism. All of avatars' skills, including their facial expressions, are thus artefacts. We are confronted with a completely artificial system that is so concentrated that everything that is possible within it. It is not only part of an anthropomorphic game, but is itself already an image, or the projection of a ludification to which the human lifeworld has been subject from the beginning. Avatars mimic the perfect mimes in order to interact with that which human theories—themselves often no more than phantasms of the natural sciences—believe or think about them. That is why there can be no confusing them and us. Even AI avatars cannot be perceived or accepted "as" people, not even if they pass the Turing test. At most they prove to be the fictions or objects of a techno-imagination that invents them in order to embed them in a surface graphic world, just as VR glasses pretend to show something "real." But their adventures remain as foreign to our experience of reality as idealized Platonic bodies are to the pyramids of Giza.

In his philosophical essay *On the Marionette Theater,* Heinrich von Kleist (1972) examines the manikin and its manipulated play. They are simultaneously clumsy as well as moving and magical, because the marionettes, dominated by the "wire or string" of the "machinest" as the puppeteer is called, lack all self-consciousness. They follow the movement of their mechanics, which follows the laws of the center of gravity, so that puppet theater becomes a paradoxical "dance," which, Kleist writes, could not be more perfect because it is *antigrav,*

that is, it escapes the inertia of material. For that reason, there is "more grace in the mechanical manikin than in the structure of the human body," for gracefulness became "more radiant and powerful" as "reflectiveness became dimmer and weaker." (Kleist 1972: 984, 987). Only when knowledge has passed through the absolute and "consciousness" has become infinite does gracefulness reappear, so that humans are imperfect beings between manikins and God, ensouled only by their attempts at an unachievable perfection (ibid.: 987).[2]

This thought can be turned around and used to look at the avatar. Marionettes fascinate us because they have the charm of a clumsy, broken, and ungainly corporeality, like young children who cannot yet coordinate their movements. They form a caricature of human liveliness, whose partial grotesquery is literally deathly earnest, because it points towards the finality and fragility of existence and corporeality. In exchange, the figures can fly; effortlessly they jump in the hands of the puppeteer, defying gravitation and then suddenly striding with seven league boots to a change of scene. Their mechanisms control them like an alien god, so that drill, incapacitation, and the excessive desire for transgression all belong together. The marionette, like the mask, plays a game of similarity and dissimilarity, whereby the similarity first becomes visible through the dissimilarity, and one reflects the other. Its *imperfectum* is however is for humans *perfectum,* because its special potential, its creative leaps, stem from its imperfection. They are the true poetics of the puppet.

Digital avatars in contrast neither know anything of such reflections nor of such poetics. For them, it is enough to be simulation and surface, which are in turn nothing other than the completion of a mathematical formula. An avatar can never be more than an approximation, for its image is made out of a network of point-to-point connections and their geometrical rotation, as in facial "landmark" detection and in the "motion capture" functions used in animation. The closer together the points, the more exact the image. But photorealism and hypermimesis never achieve infinity; the forms created can never be more than approximations whose strange smooth surfaces—lacking the abrasions of real singularities—reveal the failure of identity. Aporetically, the mathematical function—and the geometric figure—creates nothing more than an idealization that has no counterpart in reality, just as mathematics always comes up against the wall of empiricism. The perfect sphere is not a part of reality, and so every mathematical simulation is incommensurable with the uniqueness of the living creature.

Nevertheless, imperfectability is also not unknown to avatars. It consists paradoxically in the impossibility of fulfilling their foundational will to perfectibility. The strange jolting, angular movements, the uncontrollability of every individual body movement alongside facial and vocal expressions—seen in particular in *Second Life* or when computer games change scenes and it is necessary to go from one room into another—result from the "logic" of chronic inconsistencies and programming that can perhaps never be perfect, because, finite, it can never have enough processing power. But this does not make us recall grotesquery, but rather the endpoint of the models, the algorithmic tools, the slowness of the processors, and the technical and physical limits of computation. They have no existential meaning, only a formal one. They therefore seem to be free of metaphors: no symbolic meaning appertains to them, at best only an informatical "not-yet"—the never-ending dream of the phantasm of mathematical identity.

Behind the mathematical opacity of the avatar is literally nothing but a hypermimetic projection, which can be distinguished by the level of its abstract perfection, but not its philosophical meaning. That is why an inexact sketch can be more interesting than the most precise copy. If a marionette is made of individual limbs with movable parts that are moved by an outside power, and masks of cavities and concavities with holes that hide rather than reveal, everything on an avatar is like a screen. For avatars possess no gaze and no voice, and also no motor function that could express the individuality of their actions. Individuality is not an attribute of avatars, at most they have idiosyncratic features. Their dull eyes act as

2 Translator's note: There are of course many English translations of this story, many quite good, but none that fit this essay. These, like all following uncredited translations, are mine.

a screen *on* which an image is *pictured* that comes from nowhere and looks at nothing, just as their mouths and lips seem to have a secondary sound imprinted on them that does not possess a true place and belongs to no one, or as their movements are not situated in and do not stem from any body and therefore have neither a center, nor gravity, nor a feeling for the environment, nor do they seem to act on purpose. The technological tools are obvious: using artificial intelligence and deep fakes, human voices, gazes, and movements are reproduced that make use of the unclear relationship between eye and gaze, between mouth and voice, and between body, motion, and intention to undermine the sensibilities of the observer and purport to be authentic. In this way, a synthetic expression is created, a "gaze" without shame, interruption, or focus, which cannot search for or observe anything, but looks through us, that finds no target, but loses itself. Simultaneously, we are confronted with spectral voices with neither source nor addressee, and therefore without the modulation of the alterities they are speaking to, for no voice speaks for itself, it *is* only when it addresses an Other. The same is true of movements that do not orient themselves, that neither mean something nor complete an action, but operate in sterile, geometrical environments built by probability theory.

And in fact, masks, puppets, effigies, and marionettes have a completely different genealogy than 3-D avatars and robots, despite recurrent attempts to interpret avatars as the "modern mask." (Rössler, Schmidt 2010) The two groups are separated by a technical caesura or disruption between myth and poetics on the one side and technology and informatics on the other. The former derive from a genuine incompleteness that is their fundamental anthropological and existential condition. They have a special relationship to death and absence, in stark contrast to technological artefacts, which have a positive relationship to perfection and infinity and bow to a hypermimetic constructivism. Hypermimesis does not however mean a heightening of the mimetic, for *mimēsis* in Greek is an ethical figure of moderation and modesty, since the *creatio (physein)* is reserved for the divine alone. For humans there is only "emulation" *(mimeisthai);* everything else is *hybris.* Hypermimesis is therefore already hubris, and immanent to it is not only sacrilege, but also failure.

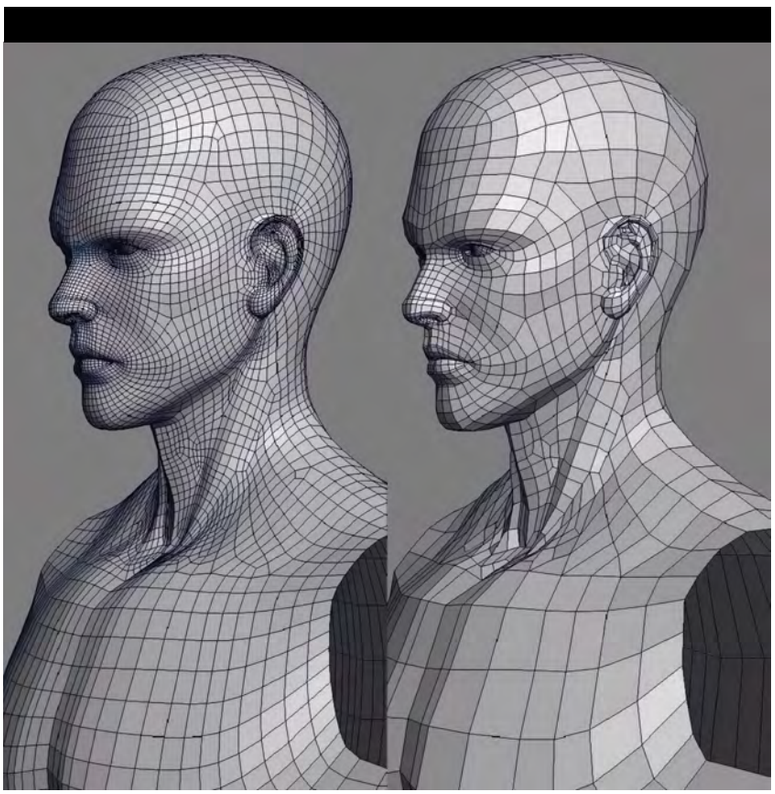

FIG. 2
THE GEOMETRY OF AN AVATAR MODEL.

The unavoidability of the latter is made clear by the utopias of the "as-if" and the idealization of appearance, which cannot be fulfilled. They flip the relationship of similarity and dissimilarity, manifest in the finite. For what is dissimilar is the wellspring out of which the similar draws its meaning, provided that comparisons and equivalences presuppose the incomparable and difference. It is only where we see differences that we can discover identities and make things become similar *(Verähnlichung).* Similarity and identity are first and foremost reflexive concepts. In contrast, simulacra whose calibrations are processes of mathematical models target equalities. Their ideal is congruency, equality of structure, and the identification of characteristics such as intelligence, creativity, intention, and expression. The entire theater of industrial technology, of which digital worlds are in the end no more than a descendent, is geared toward reproduction, that is to say toward the copy, both of which are in turn derivatives of a logic of representation. Making the absent present in an unending loop,

doubling the world and reproducing existences: this is the unspoken telos of the nineteenth century and of our present era, which seeks to escape death and finality through deceptively realistic illusions, but only produces an endless slew of kitsch.

The desire for the invention and spread of avatars is therefore the exact opposite of our cultural desire for masks and dolls, no matter what has been said (Calvillo-Gámez and Cairns 2008). They are the mirrors of our lack, which is a condition for our creativity. The term "lack," which denotes missing something, is however misleading, because that which seems to be a "lack" is an advantage and a gain. Correspondingly, avatars can never die—at most they are deleted—and they remain without tragedy or pain and therefore deserve neither empathy nor worry. To the contrary, they are cheap objects of a sado-masochistic diversion; embodiment of an unreserved desire for control and power that however, like all sado-masochism, tends to hit back, not because of inner resistance, but because of the necessary incompleteness of its construction, which also remains unforgiveable. They are the true "lack," which is why we do not shy from taking revenge on them. When that which we desire more than anything is fundamentally unfulfillable, then it must be destroyed. That is why avatars are not objects that we can love, but that we must hate. Their unfulfillable nature is built into the logic of their mathematical design.[3] Better models with optimized resolution or more precise skills might replace their predecessors, but they will invariably exhibit the same lack of unattainable completeness. This is in the end true of all artefacts, no matter how perfect, for we are always confronted with relative autonomies and the impossibility of consumation.

Furthermore, while ritual masks are part of performative cult and children's dolls belong to a poetics of transformation, the functions of avatars do not even touch the foundation of the social sphere but stand aside, so to speak, untouched and untouchable. The only social function they can fulfil is the substitution of instrumental practices—in caretaking, in consulting, as game counterparts, as the help function of human-machine interfaces, etc. But as Philipp Stoellger has recently stressed, instrumentality demands reliability, which is something quite different than commitment, trust, or responsibility, those underestimated foundations of social relationships that constitute its true *koinonia* (Stoellger 2010). We *rely* on functions, on the smooth workings of operative processes, but we *trust* in people, for the precondition of trust is "relationship," not "relations." That is why, no matter how successful the techno-social interactions between humans and machines or their iconic substitutes are, there is no human "bond," in the emphatic sense, or relationship to avatars, merely an employment or use.

That which legitimizes the sociality of the social sphere is the break or discontinuity, in one word: mortality. In return, we gain contingency and thus the chronic illegitimacy of trust, commitment, and responsibility, which have no norm or rule guaranteeing our belief in them making them in every moment vulnerable and subversive, because they force *revolvere*. The technological automatisms and their figurations, of which avatars are only one version, seem to make them redundant and to free us from them by replacing the unforeseen and the intrusion of events with ends-and-means operations that are controllable. But this implies putting repetition and identity and their fictionalizations at the center of social processes and thus privileging infinity, rather than putting difference and finiteness and with them time and history in first place.

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3 The topos of incompleteness is here a reference to Gödel's metamathematical incompleteness theorem, see Franzén (2005).

PROSTHETICS. REPLACEMENT AND EXCHANGE

JÖRG STERNAGEL

FIG. 1
HEINRICH HOERLE: *PROTHESENKOPF,* MID-1920S.
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The front cover of a Turkish edition of Théophile Gautier's 1856 novella *Avatar,* originally published in French, bears a reproduction of salinocut by the German painter Heinrich Hoerle, which was printed in the mid-1920s: it is a "prosthetic head" *(Prothesenkopf),* which has replaced a human head with an artificial one.[1]

The head is portrayed in profile—like a human portrait—but at the same time is shown to be a purely mechanical, metallic, and even electronic skull, as suggested by visible circuitry around its artificial mouth, neck, and occipital area. Only the human outlines imply that this is no longer something purely human, but a replacement thereof, a sort of prosthesis that stands in for a body part, usually a limb or organ. Whereas Hoerle depicts these contours in reference to body parts, Gautier portrays them textually in reference to the entire body, which is replaced altogether. A physician gives Gautier's chronically ill protagonist Octave de Saville the opportunity to slip into the body of another person who, as his "avatar," not only grants him health, but also the affections of his previously unattainable love interest. With these themes, both Hoerle and Gautier invite reflection on a domain of "prosthethics" that arises from a prosthesis as it opens our eyes to what can and cannot be replaced or exchanged.

REPLACEMENT

In one respect, the process of successive replacement unfolds as a situation of conflict *(Auseinandersetzung,* literally "taking-apart") that has befallen a person, a process that continues onward via the body. In the case of Hoerle and his print of the prosthetic head—as with many of his other works that address injuries caused either by the recent First World War

1 See Gautier (1888). Artwork: Heinrich Hoerle in: Backes (1981): 216 (Druckgrafik no. 31 in the list of the artist's works).

or by the burgeoning progress of industrialization—the situation is one of suffered violence that has necessitated amputating whichever part had been injured or mutilated, then replacing it with a prosthesis that would allow the person to carry on living, but also working. Even if the prosthetic head is more a robotic phantasm of a head replaced with technology, thus also replacing human thought, it does indeed belong on the list of body parts that (can) no longer serve their purpose, marked by loss and lack. Loss: I am becoming headless. Lack: I am missing my head. *How can I still perceive, think, and act? What am I suffering through, why, and how? Will I be replaced by a machine? What is this "techno-logical" development confronting me with?*

For Hoerle, this machine is an actual entity of war and of capitalism. The mechanization of life extends to the body, intervenes in it, mangles it, injures and mutilates it. However, it is humans who have authored and accordingly instrumentalized this mechanization. Particularly in the twelve lithographs depicting "cripples" in Hoerle's so-called "Cripple Portfolio" (Druckgraphik no. 17) from 1919, he depicts "passionate protest against the beastliness of war, an accounting of the enthusiasms and promises of 1914: cripples. the madness, that there are people who have been divided in thirds or in half, who go on living in an indifferent world; the sickly feverish distortions of crippled existence and their individual forms of expression have been transferred with a quick hand onto these virtuosic pages," as Hans Faber describes it in the *organ der gruppe progressiver künstler, a bis z (official publication of the group of progressive artists, a to z),* of which Hoerle was the editor (See Backes 1981: 116). The same applies to his prints *Krüppel bettelnd* (Cripple Begging) (Backes: Ölgemälde no. 18) from 1921 and *Denkmal der unbekannten Prothesen* (Monument to the Unknown Prostheses) (Backes: Ölgemälde no. 67) from 1930. The figures in both works have been given prosthetic heads, making visible in art what was already visible on the streets: people who had lost parts of their bodies during the war, who had been injured, who had been casualties of armed violence committed by fellow humans (Henninger 2004: 94–96). People who, for example, could no longer reach for something with their own hand—because that hand was missing, separated by a hand grenade—or who could no longer walk on their own two legs—because one of them was missing, having been separated by a false step on a land mine.

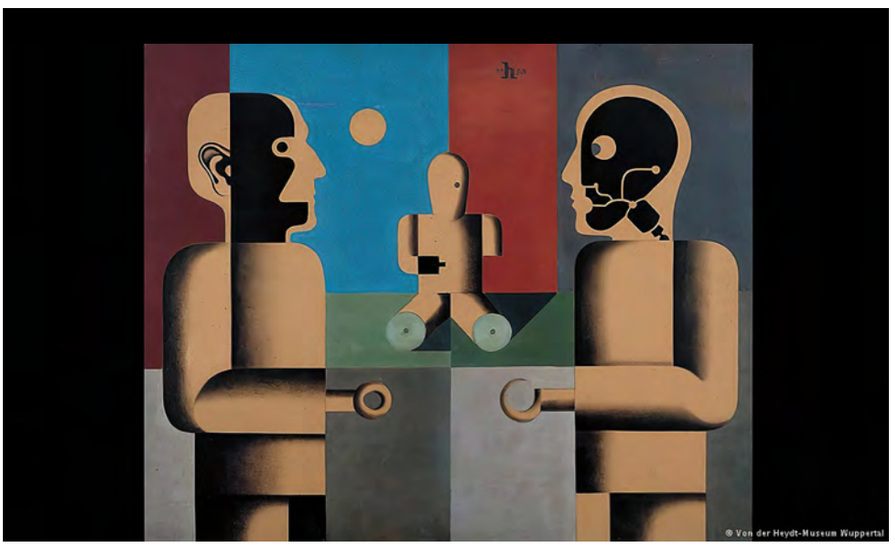

FIG. 2

HEINRICH HOERLE: *DENKMAL UNBEKANNTER PROTHESEN* (MONUMENT TO UNKNOWN PROSTHESES, 1921).

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As with Otto Dix's 1920 painting *War Cripples,* Hoerle's artworks also depict parts that had already been replaced by prostheses—the missing and therefore invisible limbs—exposing a perspective on suffering that is indispensable for understanding what makes all violent occurrences violent (their *Gewaltsamkeit,* or violent-ness), questions with which these works confront us. Pascal Delhom remarks: "For the exercise of violence is distinguished as such from other types of action only insofar as it is directed against other

living creatures and harms them; insofar as it intends to cause suffering." (Delhom 2014: 158) The factor of the exercise of violence, which here is viewed squarely in the context of action, involves an inherent premise that this action — that is, the violent occurrence — is entangled in its lead-up as well in its lasting aftermath. *Violence aims at the face of other people; aims at that face's annihilation, both in its physicality and in its unattainability; and aims at transcending it by penetrating alterity.*

Lévinas develops this idea as follows:

> ***Corporeity is the mode of existence of a being whose presence is postponed at the very moment of his presence. Such a distension in the tension of the instant can only come from an infinite dimension which separates me from the other, both present and still to come, a dimension opened by the face of the Other. War can be produced only when a being postponing its death is exposed to violence. It can be produced only where discourse was possible: discourse subtends war itself. Moreover violence does not aim simply at disposing of the other as one disposes of a thing, but, already at the limit of murder, it proceeds from unlimited negation. It can aim at only a presence itself infinite despite its insertion in the field of my powers. Violence can aim only at a face*** *(Lévinas 2007: 225).*

The injured war veteran portrayed by Hoerle has already suffered the loss of a body part in a war that affected him and other people, and that, as with every use of violence, is attributable to human beings. "There is no violence without people who exercise it or who permit it to be suffered. And if we do not ascribe a particular instance to a person and nevertheless experience it as violence, we can do so because we ascribe it to another entity, to a god or personified destiny that we view as an intentional author. Neither a natural disaster nor an injurious attack by an animal that humans have not trained accordingly is experienced as a form of violence." (Delhom 2014: 156) *Violence is contingent upon human beings. It is part of our humanity.*[2] The same holds for all its applications, which are conceptually described using words such as "structural" or "symbolic" because they are not simply natural phenomena, and nor do they follow specific causal rules of nature. They are only violent *(gewaltsam)* because they are human-authored, that is, because human beings could have controlled or prevented them and their repercussions as natural events or because they, in their production and reproduction, fall within social processes and structures of human responsibility. "Thus, phenomena of violence presuppose a causal entity that can act intentionally and can, for that reason, be viewed as violent *(gewalttätig)*." (Delhom 2014: 156) This entity is human and cannot be replaced in a *phenomenology of suffered violence,* so conceived because it holds responsibility, especially when the violence results in the injury of other living creatures. "For a living creature does not only live *in the world,* but *on its own (von sich aus)* has a connection *to the* world and to the other living creatures in the world. As the subject of this connection to the world, it perceives stimuli, discerns objects, moves self-sufficiently, and enters into relationships. Hence, it comprises the point of departure and the center of its connection to the world and to others. This connection constitutes its life." (Delhom 2014: 156–157) At this point, Delhom elucidates that not only does an injury harm the creature's body and its physical constitution, but also has repercussions that include damaging perceptions, movements, and relationships. The injury "affects it in its connection to the world and to other creatures. The specificity of the injury lies in this link between the harm to body and psyche and the damage to perceptions, movements, and relationships. Only a creature that has a connection to the world on its own *(von sich aus)* can be injured." (Delhom 2014: 157)

Delhom highlights that precisely what is affected by a violent occurrence — the aspect of *on its own, von sich aus* — defines the connection to the world and can also be described as freedom or spontaneity. "On the one hand, it is the only possible target of violence, as an intentional action. After all, what distinguishes it from all other objects is that

2 Above all, this also means not simply describing violence using terms such as bestiality or animality but bringing them back into the human realm of responsibility in order to emphasize corresponding relationships clearly.

it largely deprives the actor of intentionality and thus interferes with his privileged position at the origin and the center of his world. That is why it can only be honored or combated. It prompts either recognition or violence. On the other hand, there would be no violence either if its chosen target were entirely out of reach." (Delhom 2014: 157) Violence reaches and damages living creatures in their connection to themselves, to the world, and to others. It injures them by harming their bodies and their psychological makeup. In this regard, Delhom quotes Lévinas: "Violence bears upon only a being both graspable and escaping every hold. Without this living contradiction in the being that undergoes violence the deployment of violent force would reduce itself to a labor." (Lévinas 2007: 223) Yet violence is not only exercised, it is also suffered, and thus it is first and foremost a *misfortune* (a *Widerfahrnis,* something "befallen") and neither an action nor the effect of a structure dependent on humans. "The living creature affected experiences it as the Reversal of its connection to the world: it does not turn towards the world on its own *[von sich aus]* but is affected by something in the world to which it is exposed. Although as a living creature it is the subject of its suffering—it is not the subject in the sense of an author of an intentional act, but in the sense that it is subjected *(subiectus)* to what injures it. The subject of suffering is the subjective pole of an occurrence that has befallen it and that it cannot escape. It does not constitute an object, but rather it is affected." (Delhom 2014: 157) This suffering is precisely what distinguishes *Gewaltsamkeit,* the suffering that takes place in the mutual referentiality between suffering and its exercise or causation. "The exercise of violence can, like other forms of action, take place as a means to a specific end. It can occur as an expression of hatred, fury, or panic; it can be deployed as a demonstration of power and much more. But what constitutes the *Gewaltsamkeit* of this means, this expression, or this demonstration is that it is or could be suffered." (Delhom o. ibid. 2014: 158) Nevertheless, Delholm contends that the perspective of suffering should not be equated with that of the violence's victim. Indeed, it can also be the perspective of the witnesses of suffered violence, and "it is frequently enough the [perspective] of people who exercise or cause violence to happen and are therefore confronted with others' suffering due to said violence. Conversely, victims of violence who suffer from it can also observe it from the perspective of the act and thus understand or even justify it." (Delhom o. ibid. 2014: 159) "In other words," Delhom continues, and this is key: "the perspective of suffering is not necessarily that of the sufferer. "It also enables observation of the entire violent occurrence proceeding from what constitutes its *Gewaltsamkeit.*"(Ibid.)

For Delhom, with his phenomenological approach, this is an effort to shift the focus to the suffering, a shift based on using terminology that sensitizes to the *Gewaltsamkeit* of violence, which also means clarifying that suffering itself is not an experience in itself: "The subject of injury does not constitute that injury as its object, but is affected by the injury. Hence, *to the extent that it is suffered,* an injury is not a phenomenon. Furthermore, it harms or destroys the bodily and psychological basis for experience and movement in the world. Thus, for the sufferer, it is difficult to address what has been suffered *as suffering.* Conversely, for the other participants or witnesses of the violence, there is always the risk that they might overlook the specifically violent [gewaltsam] aspect of suffering within the object of their experience, or that they might view the violent occurrence exclusively from the perspective of the act." (Delhom 2014: 160–161) Notwithstanding, in order to scrutinize the *Gewaltsamkeit* of violence as an object of phenomenology and not as either a mere misfortune *(Widerfahrnis)*—which is only suffered and not experienced—or as the object of utterly constituted experience—which loses sight of suffering—Delhom proposes finding an approach that treats suffering as a boundary of experience and adopts a perspective of suffering that distinguishes between intrusive and exclusive violence: "Both types of violence are suffered as such; both of them affect and injure living creatures in their relationship to their habitats, in the first case though the intrusion of a foreign object that cannot be integrated and in the second case through exclusion from one's own habitat. The intrusion occurs from the outside in as an injury to integrity; exclusion from the inside out is a denial of belonging or integration. Both are injurious." (Delhom o. ibid. 2014: 161–162) And in

both cases, I observe them from within my body, from within my habitat, which I can never leave and from which I perceive the world as an exterior world of objects, from which I suffer physical violence as an intrusion.

EXCHANGE

"No one could understand the disease which was slowly undermining the constitution of Octave de Saville. He was not confined to his bed, but led his usual life, and never a complaint issued from his lips; yet it was obvious that he was dying. He could tell the physicians, whom the anxiety of his friends had compelled him to consult, of no particular pain or suffering, and their science could discover no alarming symptoms in him. When his chest was sounded, the result was favourable; and when the ear was applied to his heart, it could scarcely be said that its beating was either too quick or too slow. He had no cough and no fever; but his life was evidently gliding away and taking flight through one of those invisible crevices of which man, according to the saying of Terence, is full. Sometimes a strange faintness turned him pale and chill as a statue. For a minute or two he would seem dead; then the pendulum of life, stayed for the moment by some mysterious hand, was let go again and resumed its oscillations, and Octave woke up as it were from a dream." (Gautier 1888: 5–6).

Gautier opens his fantastical novel *Avatar* with an account of the illness of its main character Octave, an illness whose precise characteristics no one seems to know. At the start, it remains uncertain, as Gautier describes with a reference to Terence, who speaks of "imperceptible crevices in the human fabric." For Terence, this is something that can be affected by another person's misfortune or unhappiness: "I am a man; I consider nothing pertaining to man foreign to myself." (Terentius 1832: 5 line 25) In an adaptation of a lost comedy by the Greek poet Menander, the Roman Terence gives this line to the man who punishes himself: the self-tormentor Menedemus who prefers to work in the fields alone, without the help of farm hands, who he could afford. He argues that everything human is related and therefore also pertains to him and represents a human attitude that includes goodness, clemency, and consideration.[3] *A consequence of humanitas: One must practice temperance.* The Delphic maxim "Know thyself" also calls for thoughtful consideration *(Besonnenheit,* temperance) of the fact that to be human means to be mortal, which expresses a kind of incompleteness and limitation, as Plato articulates in the dialogue between Charmides and Sokrates:

> *There you are, Socrates, he said: you push your investigation up to the real question at issue—in what temperance differs from all the other sciences—but you then proceed to seek some resemblance between it and them; whereas there is no such thing, for while all the rest of the sciences have something other than themselves as their subject, this one alone is a science of the other sciences and of its own self. And of this you are far from being unconscious, since in fact, as I believe, you are doing the very thing you denied you were doing just now: for you are attempting to refute me, without troubling to follow the subject of our discussion.*

> *How can you think, I said, if my main effort is to refute you, that I do it with any other motive than that which would impel me to investigate the meaning of my own words—from a fear of carelessly supposing, at any moment, that I knew something while I knew it not? And so it is now: that is what I am doing, I tell you. I am examining the argument mainly for my own sake, but also, perhaps, for that of my other intimates. Or do you not think it is for the common good, almost, of all men, that the truth about everything there is should be discovered?*

> *Yes indeed, he replied, I do, Socrates.* *(Plato 1927: 166b–e)*

3 See, for example, Melanchthon (2018), 6–7. This maxim also inspired Cicero, Seneca, Montaigne, Herder, Feuerbach, Nietzsche, Kant, and Novalis, for example.

Temperance in dialogue: The uncertainty of self-knowledge is part of the *drama* of every body, which for Octave takes place in the here and now, as Gautier expressed using words such as "faintness," "strange," or "mysterious." Octave *is* his body, which he *has* as a physical vessel. And he *is* his suffering, which he *has* as an illness. Thus, to follow this main character, with Gautier's help, also means following him in his disturbed relationship to the world, to the others, and to himself. Thus the author reveals to us the experience of Octave's own body, his mode of existing. This mode is ambiguous because—to bear with Merleau-Ponty and paraphrase him here—if we chose to think of him in the third person as a collection of processes, such as sight, motor functions, and sexuality, we would realize that these processes cannot be interlinked and connected to the outer world via causal relationships. Rather, "they are all obscurely drawn together and mutually implied in a unique drama. Therefore the body is not an object. For the same reason, my awareness of it is not a thought, that is to say, I cannot take it to pieces and reform it to make a clear idea." (Merleau-Ponty 2002: 231) This *ambiguity of the body,* its dual existence, prevents Octave, his doctors, and his relatives from knowing any more about him beyond the notion that no other road can lead to knowledge of him besides that of *experiencing, inhabiting (er-leben)* his body, "which means taking up on my own account the drama which is being played out in it, and losing myself in it." (Ibid.) As such, Octave himself *is* his body, at least inasmuch as he calls an acquisition his own. And inversely, his body is like a natural subject, like an preliminary draft of his overall existence. "Thus experience of one's own body runs counter to the reflective procedure which detaches subject and object from each other, and which gives us only the thought about the body, or the body as an idea, and not the experience of the body or the body in reality." (Ibid.) Here, Merleau-Ponty stresses the ambiguity of the mode of existence through the experience of one's own body, which departs from the Cartesian tradition, in which the mode of existence has only two meanings and no more: existence as object and existence as consciousness. The object is thoroughly an object; consciousness is thoroughly consciousness; the body is the sum of parts without an interior; the mind is itself present being without any distance. This is precisely the point at which Gautier begins. Octave tries to say farewell to his body's drama, seeks to leave his sick body as a sum of parts without an interior, and takes along his mind as an existence that, to itself, is right there *(sich selbst gegenwärtiges Sein)* without any distance.

Gautier invokes the phantasm of transmigration, which for Octave signifies a way out of his existence, which has been determined by illness, but also an absolute fixation on another person, on the object of his affection who has been inaccessible to his current, impaired body, Countess Praskovia Labinska who is married to Count Olaf Labinski. Octave achieves both aims—to escape his body, which is suffering from illness but perhaps also from longing, and the possibility of unrestricted access to the countess—through an exchange staged in the book. With the help of the physician Balthasar Cherbonneau, Octave is able to switch minds with the Count; from that point on, his mind occupies the Count's body:

> *Doctor Balthazar Cherbonneau, as he stood between the two inert bodies, looked, in his white robes, like the sacrificing priest of one of those sanguinary religions which pile up the bodies of men on the altars of their gods. He suggested that priest of Vitziliputzili, the hideous Mexican idol of which Henri Heine sings in one of his ballads, but his intentions were certainly less murderous.*

> *He drew close to the still perfectly motionless body of Count Olaf Labinski, and pronounced the ineffable syllable; which he then rapidly repeated over the profoundly comatose form of Octave. The usually odd looking figure of M. Cherbonneau seemed at this moment endowed with a weird majesty. The mightiness of the power he wielded ennobled his irregular features; and, if anyone could have seen him thus performing these mysterious rites with so*

> *sacerdotal a solemnity, he would scarcely have recognized in him the Hoffmannesque doctor, who challenged, while he defied, the pencil of the caricaturist.*
>
> *Then some strange and wonderful things took place. Octave de Saville and Count Olaf Labinski seemed to be simultaneously shaken with a convulsive agony. Their features were contorted, and a slight foam frothed round their lips. The pallor of death bleached their skins, while two little quivering bluish gleams, burned with uncertain light over their brows.*
>
> *At a gesture of the doctor, charged to the full with magnetic influence, which seemed to point out to them the journey which the master bade them take, the two phosphorescent points set themselves in motion, and leaving behind, as they flew along, a track of light, sought their new resting-places. The soul of Octave hid itself*
>
> *within the body of the Count Labinski, and the count's soul in the body of Octave.*
>
> *The Avatar was accomplished!* (Gautier 1888: 56–57)

From that point on, Octave's minds lives in the body of another man. This gives him access to another world that does not belong to him, one in which he can meet his beloved, as he is now also her husband. Gautier has Octave's mind descend into the body of the count, completing a descent that points to the literal meaning of the Sanskrit-derived word avatar. In Indian religions, the word *avatar* refers to the incarnation of a god on earth, especially Vishnu. Gautier highlights this cultural etymology early in the novel while setting the scene of the physician's office:

> *Along the walls were hung miniature water-colour sketches, the work of some painter at Calcutta or Lucknow, representing the nine Avatars already accomplished by Vishnu in the bodies of a fish—a tortoise—a pig—a lion with a human head—a Brahmin dwarf—Rama, a hero fighting the thousand-armed giant, Cartasuciriargunen—Kitsna, the miraculous child in whom some dreamy minds have seen an Indian Christ—Buddha, the worshipper of the great god, Mahadevi—and, last of all, he was represented as in deep sleep, in the midst of the Milky Way, lying on the five-necked serpent, whose five bent heads formed a canopy over him, awaiting the hour of his last incarnation when he should assume the body of a white-winged horse, and by letting his shoe drop down upon the universe bring about the final destruction of the world.* (Gautier 1888: 45–46)

The Avatar was accomplished. The transmigration has been completed. In Hinduism, an avatar is only a vessel and no exchange occurs between the deity and the figure of an animal or human; rather, the deity takes animal or human form after "descending" into the avatar. By contrast, in Gautier's version, an exchange takes place in the phantasm of a transmigration, which proves deceptive, however, as the following scene illustrates:

> *The rest of the breakfast was eaten in silence. Prascovie was not pleased with him whom she took to be her husband, while Octave was in a state of mental agony, fearing lest he might be asked other questions to which he would be quite unable to reply.*
>
> *The countess rose from the table and retired to her own room.*
>
> *Octave, left alone, began playing with the handle of a knife, and felt inclined to stab himself to the heart, for his position had become almost intolerable. He had reckoned upon an immediate victory; and now he found himself lost in the mazy*

> *labyrinth of another man's existence, out of which he could find no way. In stealing Count Olaf Labinski's body, he ought also to have possessed himself of his thoughts and views; of the languages which he spoke; of his childish recollections; of the thousand little private matters which go to the making up of a man's personality; the threads which unite his existence with the existences of others; but for all this the skill of Doctor Balthazar Cherbonneau had been insufficient. The misery it was to be in this paradise, and yet not to dare to take one single step forward!*
> *(Gautier 1888: 99)*

Octave's suffering continues, even as an avatar, because via the actuality of his new body, he cannot retrieve what constituted that new body (but also his own, abandoned one): the habits, the skills, the linguistic knowledge, the memories, the *hidden details* described by Gautier that make up a person's selfhood, the relationships that link one person's life to the lives of others. At these moments, Gautier's prose invites us to perceive Octave's "avatarization," which has been initiated by suffering and brought about via longings or fantasies, as an idea that gradually withdraws from its bodily basis, for in the end the avatar Octave has nothing left to say: he cannot access any of the experiences that proceeded his own being-right-there *(Gegenwart). His being-there is left emptied of sense; he cannot answer to it.* From there, it is not a stretch to observe the avatar not only in text—via a phantasm, a fiction, or something imagined—but also in mediality and pictoriality, in the rise of algorithms and digitalization. This demonstrates that the avatar depicted there, with its telepresence *(Telepräsenz),* on the screen, whether controllable or not, having a presence *(Anwesenheit)* without being-right-there *(ohne Gegenwart),* does indeed create leeway for possibilities of self and other between the image and viewer—and shows that meanings can shift accordingly. Nevertheless, this is certainly nothing more than an ethereal-ization of our world in so-called cyberspace, which, as a result of its de-materialization, elevates visibility but does not solve the puzzle of invisibility; it exists in a loss of inter-corporeity, and thus cannot visibly expose the hidden details mentioned above. As Käte Meyer-Drawe stresses, "No one will discover in digitized bodies how humanity will achieve a meaningful world. The visible space is becoming dense. It does not leave behind any void in which a Cartesian pineal gland could serve as the guardian of sense." (Meyer-Drawe 1996: 140) Meyer-Drawe builds on Merleau-Ponty (2000: 215): "Meaning is invisible, but the invisible is not the contradictory of the visible: the visible itself has an invisible inner framework *(membrure),* and the invisible is the secret counterpart of the visible."[4] It thus remains puzzling even if we, joining Michel Tibon-Cornillot, assume that an "intermediary" sphere has spread out, "a meta-real seam in which the mechanical and artificial takes a place across from its human producers, who recognize it for their part as far superior to the classical machine." After all, according to Meyer-Drawe, the meaning "with which we equip our world at their suggestion will not be revealed by studying neural networks, nor will it be decrypted by information models. To understand that meaning, we have to return to the fact that we are not, after all, glass people in a glass world." (Tibon-Cornillot 1982: 146) In other words, this aesthetics of existence would only be perceivable as such if the bodily self becomes tangible *as a locus of exposure vis-à-vis other people,* in obtaining inter-corporeity, in a presence *(Anwesenheit)* that includes being-right-there *(Gegenwart),* and when corporeity is conceived as the actualization of humanness and as realization and not "avatarization," because only in realization is *ineluctable vulnerability and mortality* revealed.

The translation of this contribution is based on chapter 3 in *Ethik der Alterität. Aisthetik der Existenz*. Wien: *Passagen Philosophie,* 2020. Permission for use has been granted by the publisher.

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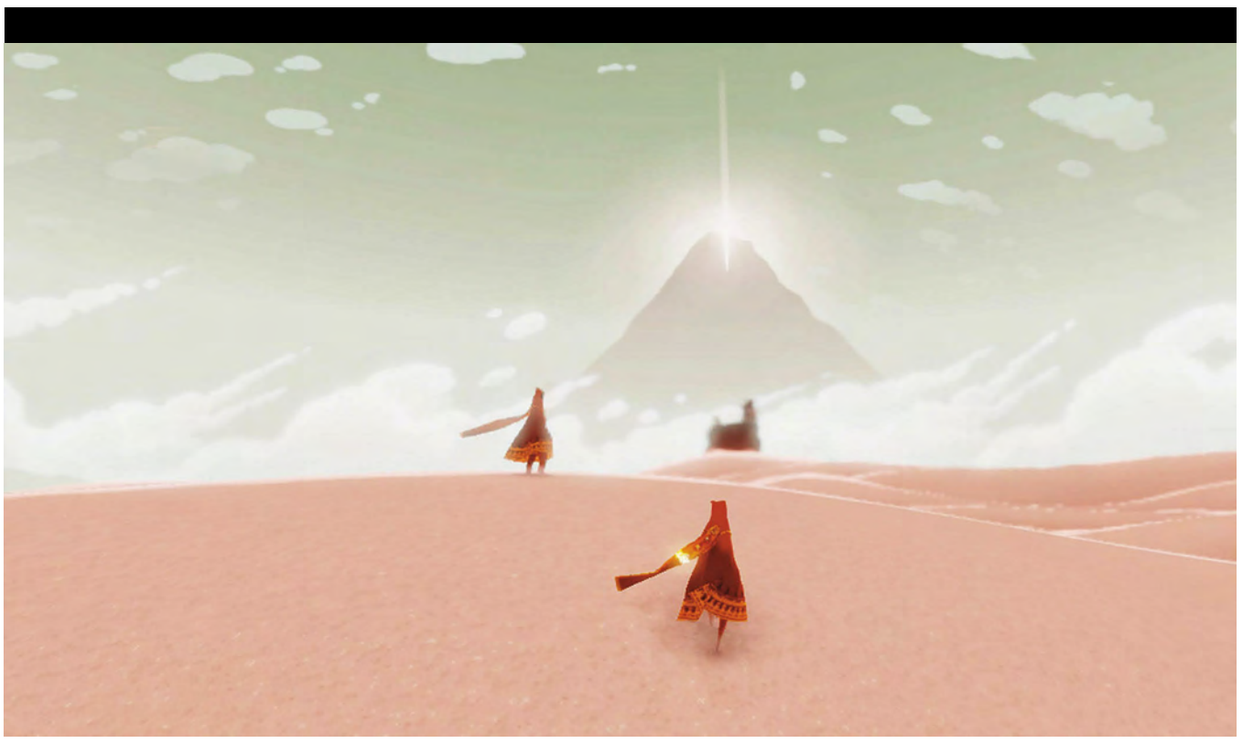
4 See also Meyer-Drawe 1996: 140.

AVATARHOOD AND SELFHOOD

RUNE KLEVJER



VIDEO GAME *JOURNEY*

"Avatar" has for more than 20 years been a common term in studies of online games and virtual worlds, following its first adaptation into digital culture with the online role-playing game *Habitat* (1986) and Neil Stephenson's novel *Show Crash* (1991). The concept has to a certain extent migrated from online contexts into the study of single-player gaming, although "player-character" and similar terms are here still often the preferred term.

There are broadly two different kinds of avatar theory. First, we may study the uses and meanings of graphic user representations in digital environments, including player-characters in videogames. The job of theory will then be to describe and map out the multiple and complex ways in which people interact with and through digital user representations, across a broad and diverse field of uses, arenas and social contexts, from *Pac-Man* to social media.

But we may also apply *avatarhood* as an analytical concept. Avatarhood is then thought of as a version of *selfhood,* and a unique principle of interfacing with computer-generated environments. Applied analytically to a given context and design, the principle

of avatarhood is a function, which means that an object or a mechanism is an *avatar* insofar that it manifests this function. With respect to videogames, this implies that playable characters can have other uses and meanings than avatarhood, other functions.

The concept of avatarhood is useful for identifying and delineating avatar theory as a field of study, as well as for analysing notions of "avatar" that are guiding creative practices in gaming and digital design. Indeed, in terms of its origins and central position in digital culture, the concept of "avatar" is primarily a creative and commercial idea rather than a theoretical-analytical construction.

VIRTUAL BODY \ PERSONA \ GAME PIECE

So what is avatarhood? The first ever graphical online multi-user game, *Habitat* in 1986, was also the first to adopt into digital culture the term "Avatar", from Sanskrit, which refers to the crossing or *descent* of a Hindi deity (usually Vishnu) into human form, as a material incarnation of a deity on earth. Chip Morningstar, one of the game's creators, felt that avatar was an appropriate term in the sense that "we humans are like deities, or at least external souls, with respect to a virtual world that exists only inside a computer simulation"[1]. The concept has since become a popular reference for any graphical representation of users or players in computer-generated environments.

THE FIRST GRAPHICAL ONLINE MULTI-USER GAME *HABITAT* (1986)

Early literature on avatars shows that the general idea of user representation, manifestation or "embodiment" in virtual environments captures two interrelated but distinct ideas. The first idea is that avatarhood is an interface to Virtual Reality, a virtual body. The focus is on embodiment in computer-generated environments in the corporeal sense, of the kind that is produced by immersive VR technology. Frank Biocca' early formulation of this concept in "The Cyborg's Dilemma: Progressive Embodiment in Virtual Environments" (1997) is instructive:

> ***In immersive virtual reality systems the avatar is not the small puppet used in standard computer interfaces, those regular computer monitors on which an iconic representation of the self is moved in a world via a mouse or joystick. In immersive VR the whole interface defines the boundaries and shape of the body by defining the boundary between inside and outside, between the part of the VR world that is "me" and the part that is "the world" (...) From coherent patterns of energy impinging on the senses (i.e., the proximal stimulus) the virtual world is divided into "self" and "environment".*** *(Biocca 1997)*

The idea that avatars are bodies in Virtual Reality has links to the concept of "presence" or "telepresence" in VR literature (Rheingold 1991, Steuer 1992). In Biocca's approach it is the embodied self-presence itself that is the avatar ("the whole interface defines the boundaries

1 http://heritage-key.com/blogs/michael-kan/what-avatar-creators-chip-morningstar-and-randy-farmer-trace-ancient-roots-latest-/

and shape of the body"), not a visually represented character. The idea of avatar as virtual body is heavily embedded in avatar etymology; the avatar is a corporeal manifestation of the player in a world of ones and zeroes, the player incarnated in digital flesh.

On the other hand, avatars have more commonly been thought of in expressive and interpersonal terms, as virtual *personas* rather than re-embodiments the corporeal sense. The avatar as digital persona is a vehicle of self-presentation, make-believe and social communication. Gregory Little's "Avatar Manifesto" (1999) articulated a variant of this concept of avatarhood: "The avatar is a delegate, a tool or instrument allowing an agency to transmit signification to a parallel world". His formulation exemplifies the way in which avatars and their "worlds" have typically been conceptualised as a discursive and communicative practice. In the field of computer-mediated communication, avatar studies has had a primary interest in graphical virtual worlds like *Second Life* (where user-characters are officially called "avatars") or online role-playing games like for example *Star Wars: The Old Republic*. Among the core concerns in the early literature were the complex and sometimes "deceptive" nature of the relationship between offline and online identities (Donath 1999), the ways in which the visual language of avatars affects perception and social judgment in virtual communities (Nowak, 2004, 2015), or how avatars reflect and propagate stereotypical racial identities (Nakamura, 2002).

The original idea of avatar as persona has also been influential in game studies and gaming discourses. Avatarhood is here most often conceived in representational terms, as the *character* of the player, in online worlds as well as in single-player games. At the same time, there is an influential tradition of theory that de-emphasizes or even rejects the significance of player-characters in player experience. Fuller and Jenkins (1995) argue that Mario or Luigi are not really characters in the narrative sense but rather "capacities for action", and as such "little more than a cursor". The observation that player-characters are mediators of player agency has been developed into the idea that avatars are interfaces to a game system (Jørgensen, 2013). Such game-entric accounts in computer game theory point to a medium-independent concept of avatarhood. Linderoth (2005) notes that "we talk about our game pieces in board games as a part of ourself, and can in the game of Monopoly claim that 'I' stand on chance". In general game design theory, Bjørk & Holopainen (2003) define "avatar" as "tokens that represent players". The notion of avatar as game piece, a *token* representative and mediator of agency within an abstract game system, indicates that avatarhood may indeed be given also a *formal* articulation. One could, after all, play Snakes & Ladders or Monopoly without tokens, just as one might do in any game that is not also a physical sport.

STAR WARS: THE OLD REPUBLIC

AVATAR: THE GENERAL IDEA

Looking for a general idea of avatarhood that may capture virtual bodies, personas/characters as well as game pieces, we may take a cue from Kristine L. Nowak. With reference to *Snow Crash,* she says that avatars "…in some way allow people to be embodied in, and

have experiences only possible in computer-generated environments" (Nowak 2015:4). This formulation connects to the original idea of descent and re-embodiment, while arguably being applicable to a range of digital environments, from *Pac-Man* to Facebook. The key idea is that avatarhood is about being "embodied" or *situated* in a digital environment, "in some way", as opposed to having direct access and agency in relation to a digital space or domain, from the outside.

Hence avatars are not cursors or tools in a purely instrumental sense, but embodied representations within computer-generated environments. "Environment" does not necessarily refer to navigable spaces in VR or videogames, but to any bounded and consistently structured domain with characteristic properties and affordances. Via the interface of the avatar, we can say that we "descend" upon a computer-generated environment, in a way that allows us to relate to it as *our* environment, our "world", our habitat. This situatedness or embeddedness, which I suggest we may call *native embodiment,* is a defining characteristic of avatarhood.

EXPERIENTIAL AND HERMENEUTIC SELFHOOD

What does it mean that an avatar is an embodiment of the *self?* In the literature on the concept of selfhood, there is broad agreement that selfhood can be defined in multiple dimensions, so that we can talk of for example "ecological self", or "social self", and so on. However there are different ways of slicing it up, different approaches to how to understand the relationship between different aspects, and different positions with respect to which aspects are more fundamental[2].

Dan Zahavi and Shaun Callagher have suggested that aspects of selfhood can be grouped under two main dimensions: the *experiential* self and the *narrative* self.[3] The experiential self refers to the "I" of subjective experience, and the immediate givenness of first-person experience and agency as *my* experience and my agency. The experiential self may also be defined as a "minimal" and irreducible sense of self-awareness; the awareness that an experience is mine rather than the experience of another cannot be put into doubt, but is a given. Zahavi (2005, 2007) says that ownership of experience is by implication *perspectival* ownership. The self-aware subject experiences in a certain way, in a certain perspective; there is, in Zahavi's words, something "it is like" for a subject to have an experience (2007:5).

In line with classic phenomenology as well as more recent ideas that cognition and the self is "embodied" or "situated", Zahavi argues that the phenomenal self is *a priori* embedded in its environment, even if this relationship may be operating behind our back, as it were, insofar that it is not included in our self-awareness in its minimal form. Self-experience is "the self experience of a world-immersed self" (Zahavi, 2007:6). This idea of the world-situated self draws attention to the self as given in bodily and perceptual experience (Gallagher & Zahavi, 2008). It also connects the experiential self to the idea of the ecological or "enactive" self, which implies that that selfhood and cognition is conditioned by the nature of human beings as *organisms,* "tuned in" to their environment and habitats (Neisser, 1988).

Zahavi and Gallagher's "narrative" self, on the other hand, is a concept more familiar to sociology, literary theory, and media- and cultural theory. The narrative self is the reflexive and conceptually mediated self, constructed through a work of self-interpretation, and can be seen as the expanded or "thick" counterpart to the minimal or "thin" phenomenal self. It is more strongly interpersonal, expanding from the minimal intersubjectivity of me-other to the social construction of the self. Significantly, the "thickness" of the narrative

2 See Gallagher (2000) for a concise overview.

3 The main idea and points of discussion are summed up in Zahavi (2007) and Belt (2019).

self involves an act of individuation, which fleshes out what it is to be "me" in particular, as opposed to someone else. In contrast, the experiential self is a "dry" or formal category, an attempt to articulate selfhood as such, in its most abstract and minimal sense.

The narrative dimension refers to the active shaping of the self, or in a stronger term, the self as an ongoing *project.* In a highly pluralistic and differentiated society, the hermeneutic self-project will typically be situated not only in a general historic and cultural context, but differentiated as multiple *roles* manifested in relation to different situations and contexts. Self-projects and roles are often made socially explicit through signifying and discursive practices, and through cultural activities of self-expression and self-authorship.

Avatarhood, then, may productively be seen as a proxy version of the kind of selfhood conceptualised by Gallagher and Zahavi. To avoid confusion in the context of avatars in digital media, *hermeneutic* is probably a better term than «narrative». In the hermeneutical dimension, selfhood is understood as a process of reflective self-interpretation and self-construction.

DIGITAL PROXY SELFHOOD

In general terms, a "proxy agent" is an authorised mediator, a representative who acts on behalf of an outside actor, an authorizer, in a given situation.[4] A proxy agent mediates ownership of actions, in such a way that the actions of the proxy agent count as the actions of the authorizer, who is then also responsible for their consequences. We may say that an avatar similarly functions as a proxy of the user or player. When I am playing a videogame via an avatar, the failure of my avatar is *my* failure, and the weakening of my avatar within its environment is my weakening in the environment. At the same time, the notion of proxy *selfhood,* inspired by Gallagher and Zahavi, implies a relation that goes beyond agency and representation in the instrumental sense.

Proxy selfhood is defined by two proxy relations:

Proxy identity, or *self-embodiment,* means that avatars are embodied externalisations of the self, mediating a subject-position and experiential ownership. Experiences via digital proxy embodiment are *my* experiences, from my perspective or "point of view". There is something "it is like" to be me as a particular avatar. Proxy selfhood is a *monadic* relation, a self-to-self relation. This distinguishes avatarhood from the relation between an authorizer and proxy agent, which is a dyadic relationship. It also differentiates avatars from the kind of dyadic relationships we are familiar with from literature and cinema, in which we are able to identify with or project ourselves into another person, imagined or real. Avatarhood is an identity relation, not a relationship of identification.

Proxy situatedness, or *native embodiment,* is the avatarial version of situated or embedded selfhood. The term "native" highlights avatarhood as interface, a traversal function, a re-embodiment of the self across the human-digital divide. Unlike a purely instrumental interface (like mouse cursor or voice command), digital proxy embodiment situates the player or user as a natural member of the environment. In native embodiment, the "passive" or centripetal relation between avatar and its environment — the ways in which agents and forces can *affect upon* it — is as important as the active or outward-moving, centrifugal relation of agency and mastery. The centripetal relation is of particular importance in gaming. Via the principle of avatarhood, video game players are being subjected and exposed to an alien and often hostile environment, as native inhabitants.

Native embodiment is an *alterity* relation, a temporary re-embodiment of the self as a technological construction, the self as nonself. In cultural and psychological terms, participation and engagement through avatarial interfaces thrives on this underlying paradox. In avatarhood, selfhood is being offset and put into play; I am experiencing a version of my self that is native to an alien environment.

4 MacPherson (2010), quoted in Carlson and Taylor (2019)

Native embodiment is also a *role* at the level of experiential selfhood, a pre-reflective externalisation of the self, which may be brought to awareness and fleshed out in the hermeneutical dimension. This role is also very often designed to be an active proxy relationship, a project of self-construction and self-authorship, via the technological tools of avatar configuration.

DOMAINS OF AVATARHOOD

The concept of avatarhood as outlined above is rooted in video gaming and virtual worlds, but can also be applied more widely to throw light on avatar-like aspects of digital identities online and in networked society in general. With respect to gaming, the avatarhood approach emphasises situatedness and the centripetal dimension more strongly than established accounts in game studies, which overall tend to focus their attention on agency and creativity. The idea that avatarhood is a proxy self-world relationship also points to the *existential* relevance of avatars, as has been examined by Vella (2015) and Kania (2017).

With respect to online sociality in virtual worlds, attention to the experiential dimension of selfhood draws attention to the way in which avatars are *corporeal* extensions as much as communicative ones, even if this aspect tends to be given less attention in psychological and sociological research. In their study on avatar personalisation in three virtual worlds Ducheneaut et.al (2009) concluded that "…avatars might be a better vehicle to explore new forms of physical embodiment rather than for exploring new facets of one's personality (1160)".

The notions of proxy selfhood and native embodiment go against the popular idea of Total Immersion, which has been seen as the holy grail in a long tradition of immersive amusement technologies, and which has also been reflected in Hollywood fantasies like *The Matrix* or *Avatar*. This VR ideal posits that virtual embodiment should be, as much as possible, a *replica* of natural embodiment, and that, accordingly, interfaces should be naturally immersive and immediate. In contrast, the principle of proxy selfhood accentuates the alterity dimension of digital self-embodiment, which is premised on dedicated learning and habituation rather than sensorial immediacy.

SECOND LIFE

Journey (Thatgamecompany, 2012) illustrates the significance of corporeal virtual embodiment and learned proxy embodiment in online environments. In this game there is no verbal communication when player-avatars meet and join, no identity markers, and limited possibilities for visual expression. Indeed there is very little beyond the experience of being physically together in a particular place, by extended proxy. This intuitive sense of bodily co-presence is not produced via immersive VR interfaces, but via the learned motor-perceptual practice of inhabiting the lands of *Journey* as avatar, via the fingertip interface of the game controller.

With respect to identities in social media, proxy selfhood is anchored not so much in the visual representations of users (which may sometimes be referred to as "avatars"), but in the activities and characteristics of a user profile as such. As in *Second Life* and similar virtual environments, saying that your social self on Facebook is simply yourself in front of the computer is not the whole story. In this context, the concept of avatarhood serves to highlight not only the mechanisms of active self-interpretation and self-presentation involved

in maintaining our online social personas, but also the *formal* definition and positioning of ourselves as avatars in an algorithmically structured social and public environment. Such formally articulated avatars, like any avatar, are only in part constructions of our own design.

As a special variant of "extended selfhood" (Belk, 1988), the concept of avatarhood can also be applied more broadly, to address native embodiment in the dataspaces of modern life. Avatarhood in this expanded sense would apply to the "you" that is being targeted by google ads online, as well as to our digital identities as defined by government, work and career. E-government platforms, workplace portals, and other personalised interfaces make formal identities accessible and manageable in a way that was unimaginable just thirty years ago. This development arguably changes the nature of formal identity from public record to proxy selfhood. As in the games we play, our avatarial selves in digital society are vehicles of self-monitoring and scorekeeping, in ways that resonate with broader trends towards the gamification of modern life.

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THE SELF AND ITS AVATARS IN NEURO-PSYCHIATRY

PETER BRUGGER

Musing about the similarities between reduplications of the self in neuropsychiatric disorders and personalized avatars in virtual reality (VR) video games invites questions fundamental to both cognitive neuroscience and cognetics (BOX): What are the conditions for embodiment? Is self-duplication possible? Can a "disembodied state" be induced? How can somebody made feel at a remote place, inhabiting another body, acting at a distance? What role plays perspective taking in real and virtual environments and how important are individual differences in the ability to switch perspectives? What if one's avatar looks like oneself, moves like oneself, feels like another self—yet, seeks to dominate oneself? Is there a thing like "thought insertion" by an avatar? Can avatars promote altruism? What makes them powerfull marketing agents?

The present essay is an introduction to the complex interactions between the self and some "natural avatars", i.e. variants of the self that may be experienced in neuropsychiatric conditions. It offers a systematic classification of autoscopic phenomena (BOX), i.e. of *doppelgänger*[1] as they manifest themselves with or without overt brain damage. The classification is based on phenomenology (Brugger et al., 1997); doppelgänger can be seen, merely be felt at a specific location in peripersonal space, or be experienced as a multimodal mixture of seeing and feeling. Neurological avatars, brain-generated reduplications of the self, may develop a will of their own and at times even oppose their owner's intentions. In fact, hostile interactions between a person and her antagonistic doppelgänger are among the most astounding distortions of self-experience. The belletristic literature is a rich source of descriptions (Dieguez, 2013)[2] and reflects the broad range of doppelgänger manifestations. I review the clinical literature by beginning with the least dramatic kind of doppelgänger, the mere visual reduplication of the self.

THE VISUAL DOPPELGÄNGER: AUTOSCOPIC HALLUCINATIONS

In an autoscopic hallucination, a patient sees an image of himself "as in a mirror". In the old French medical literature, these visual reduplications were consequently referred to as "hallucinations spéculaires", i.e. mirror hallucinations. Colors may be vivid and the focus is

1 The English language literature usually writes "doppelganger", avoiding the umlaut "ä". I use the German spelling (though with a small-cap "d"), which does not change the English pronunciation. Note that the German word has no "s" in plural; it is one doppelgänger and two doppelgänger.

2 The anthropological literature on doppelgänger phenomena is revealing as well. A classic is Rank (1914), whose psychoanalytic stance may be apologized, but whose treatment of the universal use of symbolic forms of reduplication (comprising the soul, shadows, reflections, self-portraits, twins and dolls) is impressive both in scope and detail. See also Todd and Dewhurst (1962).

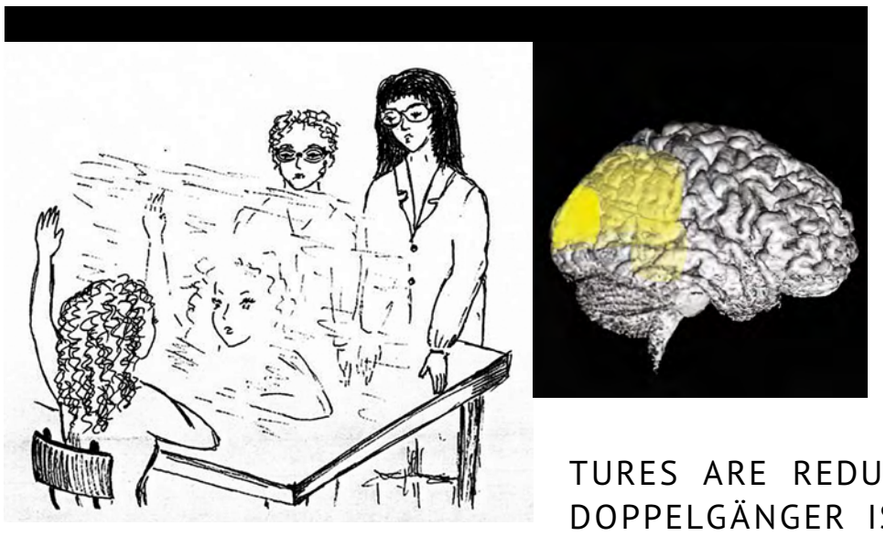

FIG. 1

IN AN AUTOSCOPIC HALLUCINATION, ONLY VISUAL FEATURES ARE REDUPLICATED AND THE DOPPELGÄNGER IS A MIRROR IMAGE. BRAIN LESIONS TYPICALLY INVOLVE THE VISUAL CORTEX, MORE FREQUENTLY OF THE RIGHT HEMISPHERE. LEFT: A PATIENT WITH A BILATERAL OCCIPITAL STROKE SAW HER DOPPELGÄNGER MIMICKING HER GESTURES. SHE NOTICED THAT MOVEMENTS WITH HER LEFT ARM MADE THE MIRROR DOUBLE MOVE ITS RIGHT. THE HALLUCINATED SCENE PARTIALLY COVERED OBJECTS AND PERSONS IN THE BACKGROUND

(FROM ZAMBONI ET AL., 2005, FIG. 2). RIGHT: ADOPTED FROM BLANKE AND METZINGER, 2009, FIG. 2.

on visual detail. Autoscopic hallucinations are always pathological and indicative of some damage to the "visual brain", i.e. its most posterior parts (Fig. 1, right panel). Right-sided lesions are more frequent than left-sided lesions, in accordance with the right hemisphere's stronger involvement in face processing, in particular in the processing of one's own face (Keenan et al., 2001). The duration of an autoscopic hallucination is variable, but tends to be short, especially when it occurs as a seizure manifestation.

THE SENSED PRESENCE: AN INVISIBLE DOPPELGÄNGER

The convincing awareness that somebody else is nearby has the same perceptual quality as a phantom limb, whose presence is only felt, vividly and precise with respect to spatial localization even in the absence of any visual confirmation. Although sensed presences are not always recognized as one's doppelgänger, an almost eery feeling of belonging evokes strong bonds with "the one out there"[3]. Identification as a second self occurs when the presence imitates a patient's bodily movements. Sensed presences have been conceived as "coenesthetic doppelgänger" (BOX coenesthesia), that is, duplications of the bodily sense, without any visual component. Accordingly, lesion location in cases of neurological patients is more anterior to the visual brain, i.e. mostly in the parietal lobes (Critchley, 1955) or in the region of the insula (Heydrich and Blanke, 2013; see Fig. 2), which processes nonvisual aspects of inner bodily functions. The sense of presence is also experienced by healthy individuals; it occurs especially frequent in single-hand sailors or mountaineers, when they are exhausted, dehydrated, socially isolated and in immediate danger (Suedfeld and Mocellin, 1987).

3 *Le Horla* is the one "out there" *(hors-de-la)*, which haunts Guy de Maupassant's protagonist in a 1886 novel. He describes in gripping diary style how the invisible being drives him mad. In the end, the protagonist decides to kill the sensed presence, only to recognize in the concluding sentence that, to effectively get rid of it, he will have to kill himself.

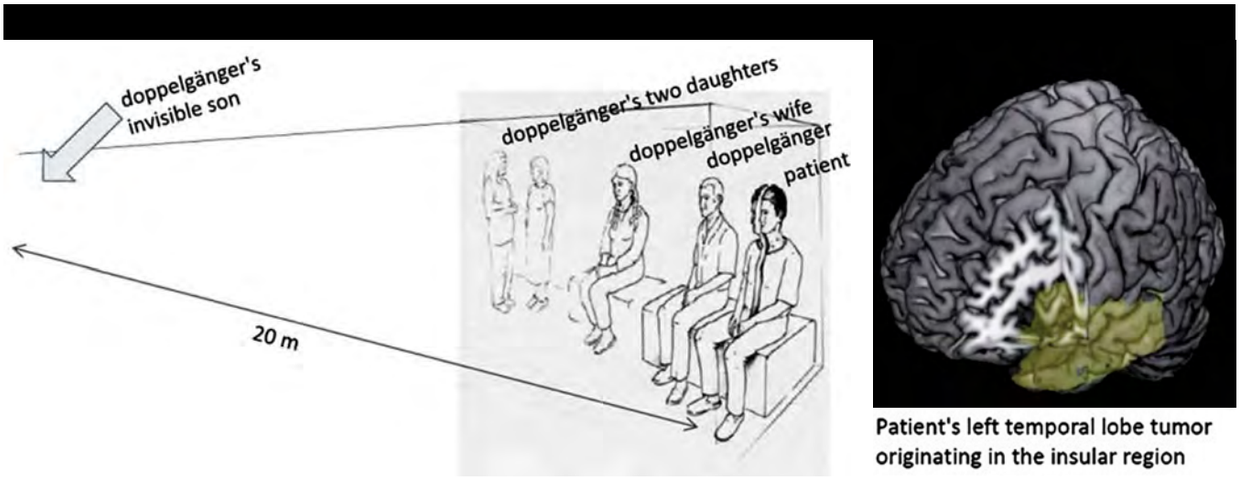

FIG. 2

A "SENSED PRESENCE" (ARROW) CANNOT BE DIRECTLY VISUALIZED. NEVERTHELESS, A PERSON CAN LOCALIZE HER INVISIBLE DOPPELGÄNGER IN THE SURROUNDING SPACE AS ACCURATELY AS AN ARM AMPUTEE CAN LOCALIZE HIS PHANTOM HAND. CORTICAL CORRELATES COMPRISE LESIONS TO THE PARIETAL OR TEMPORAL LOBES, BUT THE PHENOMENON IS FREQUENTLY EXPERIENCED BY NEUROLOGICALLY HEALTHY PERSONS. THE FIGURE DEPICTS AN INSTANCE OF A STRICTLY RIGHT-SIDED "POLIOPIC HEAUTOSCOPY" EXPERIENCED BY A MAN IN HIS EARLY FORTIES WHO, AS THE FIRST MANIFESTATION OF A TUMOR IN HIS LEFT TEMPORAL LOBE (RIGHT PANEL, ADOPTED FROM HEYDRICH & BLANKE, 2013, FIG. 1H), EXPERIENCED AN ENTIRE "DOPPELGÄNGER FAMILY", WHOSE MEMBERS KEPT A FIX DISTANCE TO HIS BODY WITH A DECREASING PSYCHOLOGICAL AFFINITY WITH INCREASING DISTANCE. THE SON WAS AN INVISIBLE DOPPELGÄNGER, NEVER VISUALIZED, BUT DISTINCTLY FELT AT A DISTANCE OF 20 M (ADOPTED FROM BRUGGER ET AL., 2006, FIG.2).

HEAUTOSCOPY: THE CLASSIC DOPPELGÄNGER EXPERIENCE

The term "heautoscopy" alludes to the self being split into a perceiving and a perceived part. In contrast to an autoscopic hallucination, a person does not see a mirror image of herself, but another self. Visual features are of secondary importance, the doppelgänger can look very differently, represent an image of oneself from a different age[4], or of the opposite sex ("heterosexual heautoscopy", Fig. 2). The defining feature of heautoscopy is the *feeling* that the seen figure is another self, a doppelgänger. Self-location can be ambivalent; at one instance the person appears to look at her doppelgänger, at another instance she may *be* the doppelgänger who looks back onto her body (see the next section). It is this existential uncertainty about who and where one really is that leads to a bewildering variety of most complex cognitive and emotional interactions between self and doppelgänger. No doubt, this is the reason for the fact that the motif of the double is abundant in belletristic treatments of neuropsychiatric signs (Dieguez, 2013). While beneficial interactions in the form of the doppelgänger taking the role of a guardian angel or of a consoler are described, hostile

4 Most frequent (and terrifying) is a pronounced age-progression of the doppelgänger (Galant, 1929), culminating in seeing it dying or attending its funeral (Lhermitte, 1951).

interaction predominate both the belletristic and clinical literature (Brugger, 2007). Many writers describing doppelgänger phenomena in their work have reportedly experienced heautoscopy themselves. Probably the most famous example is Fjodor Dostoevsky ("The Double"), whose autoscopic experiences were triggered by temporal lobe epilepsy (Menninger-Lerchenthal, 1946), but also Johann Wolfgang von Goethe gave an autobiographic account of heautoscopy, which he experienced, neurologically healthy, in a critical moment of his life (Menninger-Lerchenthal, 1932). In clinical practice, the theme of "heautoscopic suicide" illustrates that the literal killing of oneself may be avoided by having one's doppelgänger commit suicide (Arenz, 2001) or by attempting to kill one's virtual rather that one's real self (Lukianowicz, 1958; Ames, 1984). These symbolic ways of extreme self-harm have also been famously described in the work of renowned writers. In "William Wilson", Edgar Allen Poe has the hero stab his doppelgänger and Oscar Wilde ("The portrait of Dorian Gray") describes how the protagonist, who intends to attack his self-portrait,

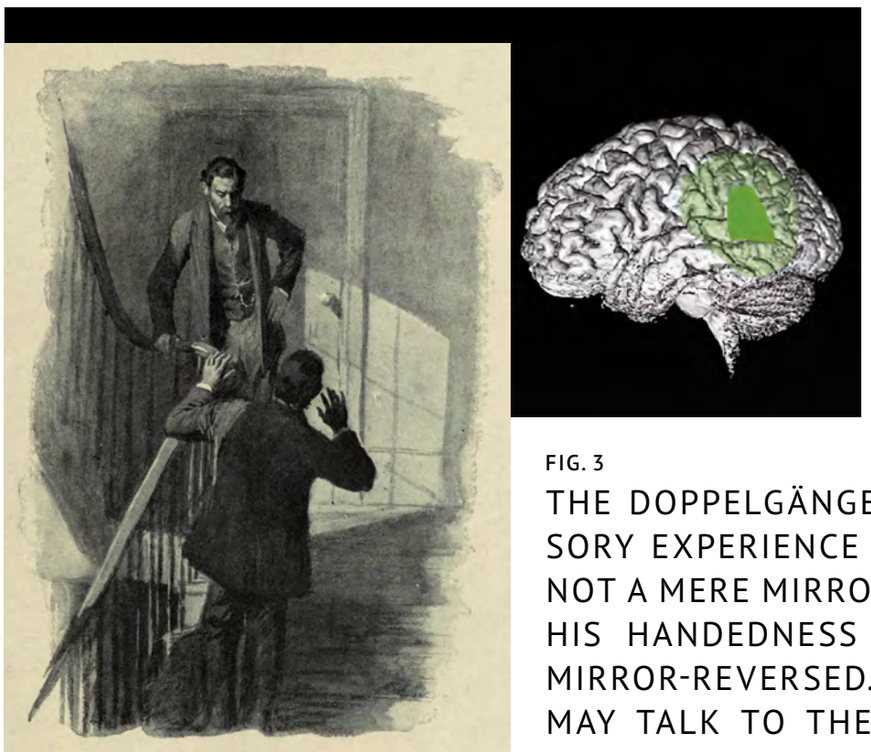

FIG. 3

THE DOPPELGÄNGER IN THE MULTISENSORY EXPERIENCE OF HEAUTOSCOPY IS NOT A MERE MIRROR IMAGE OF ONESELF. HIS HANDEDNESS IS PRESERVED, NOT MIRROR-REVERSED. IT IS SEEN *AND* FELT, MAY TALK TO THE PERSON, OR SHARE THOUGHTS TELEPATHICALLY[5]. ITS SUDDEN APPEARANCE IS OFTEN FRIGHTENING (LEFT PANEL FROM BANGS, 1898, P. 116). IF EXPERIENCED IN THE COURSE OF BRAIN DAMAGE, THE LESIONS GRAVITATE TO THE LEFT TEMPORAL LOBE (THE RIGHT PANEL, ADOPTED FROM BLANKE AND METZINGER, 2009, FIG. 2, DEPICTS A LESION OVERLAY OF SEVERAL CASES).

is found with a knife plunged in his heart. Assaults by one's own doppelgänger have also been described, both in literary accounts and medical case reports. Thus, the hero in Dostoevsky's "The double" is first humiliated, then physically attacked by his doppelgänger. A patient of Bakker and Murphy's (1964) was found with her tongue cut. She denied self-injury, but insisted that her aggressive doppelgänger had attempted to strangle her and attacked her with a knife. Less dramatic appear fictious accounts of persons, who kill themselves in order to escape the burden imposed by heautoscopy; Rudyard Kipling ("At the end of the passage") and Friedrich von Gerstäcker ("Der Doppelgänger") each provide an example. However, the same motif found in medical records may provide a most dramatic read.

5 Apparent telepathy is often experienced in autoscopic encounters. It is as virtual as the doppelgänger itself; extrasensory perception does not exist in the real, physical world (Brugger and Taylor, 2003).

Arthur Wigan, an early scholar investigating psychiatric aspects of functional hemispheric specialization, reports the case of a gentleman, who day and night felt persecuted by his doppelgänger. He finally shot himself to stop the horror (Wigan, 1844/1985, p. 96). We described an epileptic patient's fenestration in an attempt to "stop the intolerable feeling of being divided in two" (Brugger et al., 1994, p. 839).

Identification with the doppelgänger in heautoscopy is greatly enhanced over identification with one's mirror image in an autoscopic hallucination. This is because in the latter form of reduplication only the visual features are mirrored, and they are mirrored in a literal sense: the autoscopic doppelgänger waves its left hand if the person waves her right (Fig. 1). In contrast, one's heautoscopic double has always the same handedness as its owner; not only visual features are projected into the image, but also body schema which represents non-visual bodily sensations such as size, heaviness, interoceptive feelings and motor asymmetries, including hand preference. Awareness of the sum of these nonvisual properties of one's own body is sometimes designated as "coenesthesia" (BOX). It is these non-visual components that bring about the uncanny dimension of autoscopic phenomena, including ideas of persecution and the urge to kill the doppelgänger (see also footnote 3).

THE OUT-OF-BODY EXPERIENCE: FROM SEEING TO BEING ONE'S DOPPELGÄNGER

Investigations of out-of-body experiences (OBEs) were long frowned upon in the established medical and psychological sciences. They belonged to the domain of "psychical research" or parapsychology. These fields provide valuable descriptive accounts of the phenomenon, but have added little to an understanding of the underlying mechanisms. Naturally occurring OBEs give testimony to the tight interplay between emotional and spatial processing. In situations of life-threatening danger, the person feels detached in a double sense: the (apparent) physical detachment from the body is accompanied by a corresponding emotional detachment. Thus, during a fall, a mountaineer may watch a body fall, discover with amazement that it wears the same cloth and an identical rucksack as he does, and matter-of-factly but emotionally unconcerned, conclude that this must be himself (Brugger et al., 1999; Blanke and Dieguez, 2009). This protective function of an OBE is particularly well illustrated by accounts from those who were convinced to face death, but the double-detachment is a more general feature of autoscopic phenomena, specifically heautoscopy. When death is not immediately imminent, the doppelgänger may still act as a consoler. Thus patient often ascribe their suffering to the one nearby and ask the medical personnel to first care about their doppelgänger, as it would be *him,* who actually was in great pain. Even more prosaic is the instance of the doppelgänger, who did the lawn-mowing a patient was expected to do, but felt too fatigued and unmotivated (Devinsky et al., 1994, case 9). The concept of transitivism (Wernicke, 1900), i.e. the projection of own symptoms, intentions or actions onto others, is crucial here; some scholars devoted entire monographies to this transitivistic role of autoscopic phenomena (e.g., Müller-Erzbach, 1951; Mikorey, 1952). Transitivistic projections come in degrees: while unilateral somatic signs are usually projected onto other people in a mirror-like fashion (Gloning et al., 1957), they respect handedness when projected onto one's own doppelgänger, i.e. a left-sided hemiparesis manifests as such also on the doppelgänger (Brugger, 2002[6]). In OBEs, protective split of the self into two selves just goes that far, that a person will rather *be* than *see* a doppelgänger. It is this complete illusory projection of the bodily self (BOX) into extracorporeal space, which consoles an individual

6 This reference for an extensive discussion of the joint role of somatic and psychological perspective-taking.

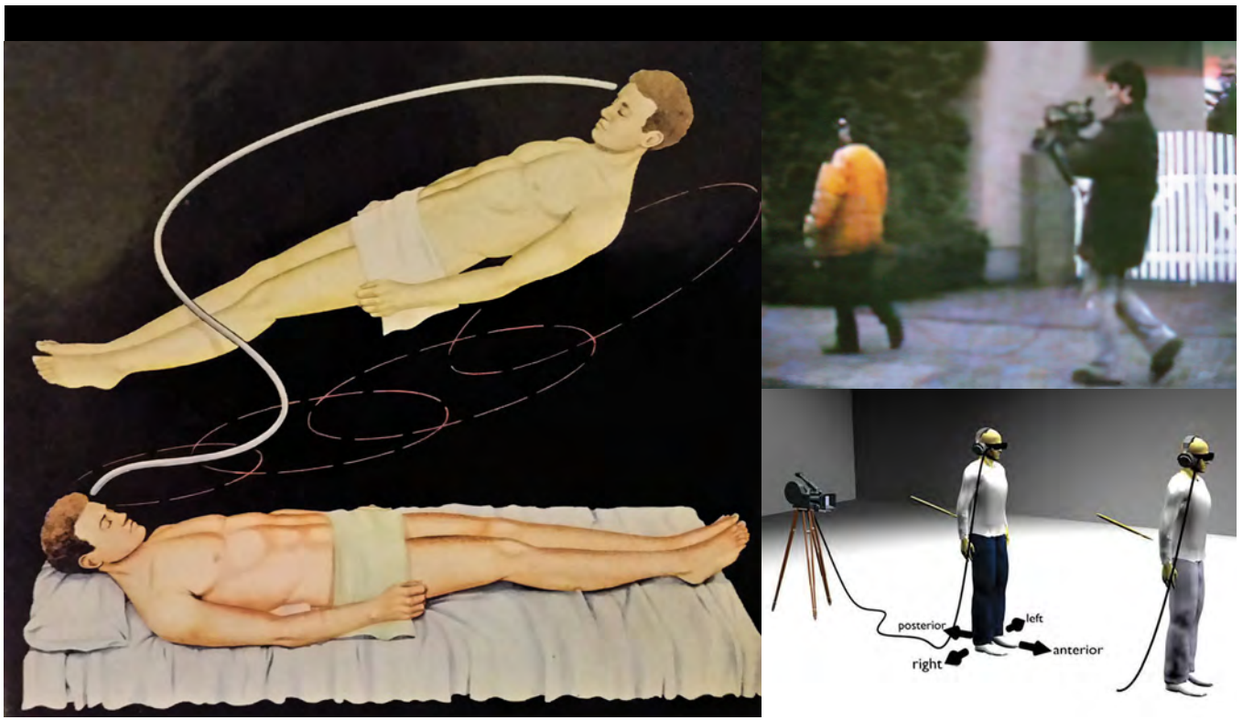

FIG. 4

IN AN OUT-OF-BODY EXPERIENCE THE OBSERVING SELF APPEARS TO BE LOCATED OUTSIDE THE BODY. THE PERSON NEVER REFERS TO ANY DOPPELGÄNGER, BUT REPORTS SEEING THE *OWN BODY* FROM OUTSIDE
(LEFT PANEL FROM THE COVER OF BLACKMORE, 1982).
THIS ILLUSORY EXPERIENCE CAN BE ELICITED BY ELECTROCORTICAL STIMULATION, ESPECIALLY OVER THE RIGHT TEMPORO-PARIETAL JUNCTION, A MULTISENSORY AREA FREQUENTLY AFFECTED IN NEUROLOGICAL PATIENTS, WHO REPORT OBES. HOWEVER, OBES CAN ALSO BE EXPERIENCED BY HEALTHY PERSONS, ESPECIALLY IN LIFE-THREATENING SITUATIONS. THEY CAN BE SIMULATED BY WATCHING A MOVIE OF ONESELF TAKEN FROM BEHIND AND FED ONLINE INTO A HEAD-MOUNTED DISPLAY. THE SIMULATION IS MOST EFFECTIVE IN REAL LIFE SITUATION
(TOP RIGHT PANEL: THE AUTHOR WALKING THROUGH THE STREETS OF COLOGNE; FROM THE MOVIE "DER ZWEITE LEIB" BY DANIEL MÜLLER, KÖLN, 2003),
BUT CRITICAL FACTORS CAN BEST BE CONTROLLED IN A LABORATORY SETTING
(BOTTOM RIGHT PANEL ADOPTED FROM LENGGENHAGER ET AL., 2007).

facing death. And it is the universal occurrence of OBEs under these circumstances (Sheils, 1978) that may console whole subcultures in contemplating the mortality of the person after bodily death.

NEUROLOGICAL AND DIGITAL DOPPELGÄNGER: POINTS OF CONTACT

Avatars are doppelgänger in the sense that they are digital representations of a person's self. Rather than brain-created, they are created by a computer algorithm, which simulates the presence of a second self. This simulation comprises different components. In part, the feeling of relatedness toward one's avatar rests on visual similarity. By uploading self-face photographs, players can make a generic character take their own appearance. Such photo-realistic resemblance not only increases identification with the avatar but also leads to an enhanced Proteus effect (BOX; Yee and Bailenson, 2007). This effect refers to a change in a player's behavior caused by the type of avatar used; identification with an attractive avatar, for instance, makes a player more gregarious and behave more socially. Age-progressed avatars make players more future-oriented and increase saving behavior (Hershfield et al., 2019). However, visual similarity based on facial configurations, is just one thing. Its contribution to the feeling of embodiment is relatively modest. As in an autoscopic hallucination, a doppelgänger-avatar merely mirroring one's facial identity will not be embodied persuasively. The sense of embodiment, a key factor for both the neuroscience of the self and VR game design, relies on three dimensions (Blanke and Metzinger, 2009); self-location and corresponding perspective (e.g., if I feel located in a body and perceive the environment from that particular point in space), ownership (I experience the body and its single parts as my own), and agency (I can move the body intentionally). VR simulations of OBEs quantify the degree of embodiment by "proprioceptive drift", that is the indicated shift of self-location away from that of the real body towards the virtual body. Such drift is induced by having research participants observe themselves being touched on the back in a real-time clip taken from behind (Lenggenhager et al., 2007; cf. Fig. 4). Although visual similarity does play a role (there is no proprioceptive drift towards a non-anthropomorphic object), the key factor is visual-tactile synchrony and synchrony of the intention to move an avatar's limb and instantaneously seeing it move accordingly. Synchrony-dependent multisensory and sensory-motor integration is necessary for an optimal identification with any object, being it one's real body, a doppelgänger or an avatar. Accordingly, designers of immersive VR games strive to add more senses than just vision to the experience of exploring digital environments — from haptics to 3D audio and even to scent and taste (Ranasinghe et al., 2017). In the future, adjustment of an avatar's heartbeat such that it follows its owner's rhythm may further contribute to the emergence and sustainability of embodiment (Aspell et al., 2013).

What the study of autoscopic phenomena unequivocally shows is that the observer's perspective matters a great deal. While a disembodied perspective experienced during fright-induced OBEs signals the loss of concern about the body's fate, perspective-taking also matters in dreams and personal memories. Dangerous scenes or fear-loaded memories are typically remembered from a disembodied, third-person perspective while neutral or positive-emotional memories are remembered as originally experienced, i.e. from a within-body location (Nigro and Neisser, 1983). There is experimental evidence that cues encoded during a simulated out-of-body perspective are less well remembered than the same cues picked up from a body-centered first-person perspective (Bergouignan et al., 2014). These are neat illustrations of embodied cognition. They also give testimony to the interactions between emotion and space. Clinical wisdom has it that, statistically, benevolent

doppelgänger approach a person primarily from the right side of space while malevolent reduplications rather prefer to manifest themselves along the left side of one's body[7]. Game design could profit for implementing algorithms, which allow a sudden switch of perspective depending on situational details in a game.

As emphasized by Bailenson (2012), what makes a conventional avatar a doppelgänger avatar is the ability to act independent of the associated human agent. The psychological effects of such "avatars who ignore their owners" (Bailenson and Segovia, 2010), are manifold and powerful. Fortunately, the negative, self-destructive properties of brain-derived doppelgänger reviewed above will not pay out for the gaming industry nor for other commercial VR applications. There are many ways to profit from a potentially beneficial impact of digital doppelgänger (Rheu et al., 2020, for a review of the use of avatars to promote health behavior). Imagine you immerse in a game-like video observing your personalized avatar in everyday situations. It is programmed to gain weight after a week you neglected physical exercise and to loose weight once you vigorously trained. There is empirical evidence that your exercise behavior can be positively influenced after receiving such vicarious reinforcement by your doppelgänger (Fox and Bailenson, 2009). "Avatar therapy" (Gerner, 2020, for a philosophically informed overview) provides a growing means to treat a broad range of psychological disorders, from phobias to hallucinations and other psychotic symptoms. Perhaps, it will also prove useful to treat "digital depersonalization" (Bezzubowa, 2020), a confusion between real and virtual self, which may manifest after repeated shifts between physical and virtual realities?

SOME TECHNICAL TERMS FROM CLINICAL AND COMPUTER SCIENCE

Autoscopic Phenomena	A class of illusory reduplications of body and self. Comprises the four types of doppelgänger discussed in the present chapter plus negative heautoscopy (not seeing oneself in a mirror) and inner heautoscopy (visualization of inner organs in extracorporeal space).
Bodily self	The experience of oneself as an embodied being, who perceives the environment from a particular location in space with a corresponding perspective and whose motions follow one's intentions.
Coenesthesia	The general awareness of one's body arising from aggregated non-visual, mostly interoceptive impressions about one's bodily state.
Cognetics	A branch of robotics that unites robotic technology and the cognitive neuroscience of bodily awareness and self-consciousness to develop machines capable to accommodate self-other differentiation, empathy and social interactions.
Proteus effect	The modulation of a person's behavior by properties (perceptual or personality-related) of her avatar.
Transitivism	The projection of a patient's symptoms onto other persons or a doppelgänger of herself

7 This rule, quantitatively supported in the case of visual hallucinations (Walters et al., 2006) is one manifestation of a more universal law, valid in all humans and animals with a bilateral body symmetry and right-sided motor preferences: the association of "good" with "right" and of "bad" with "left" (Tamagni et al., 2009 for the literature).

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THE SECRET BEHIND THE ACTOR-AND-AVATAR FMRI-STUDY

LORENA KEGEL

Computer-generated faces, or avatars, are often used for commercial purposes in advertising and service industries or scientific applications. Using advanced software, it is possible to create human-like avatars that look and move highly realistic (de Borst/de Gelder 2015). However, we do not know if we perceive human-like avatars in the same manner as other human beings. How does the artificialness of avatars influence brain processes that underlie our behavior towards them? With our research, we work towards closing this knowledge gap and study the difference between the processing of facial expressions shown by human-like avatars or actors. This is realized using a technology called functional magnetic resonance imaging, which is described in the next section.

WHAT IS FUNCTIONAL MAGNETIC RESONANCE IMAGING AND WHY ARE WE USING IT?

Functional magnetic resonance imaging (fMRI) is a variant of magnetic resonance imaging (MRI). Both are imaging techniques that allow us to study the brain from the outside while it is in action. When we are using fMRI, we create images of how the brain is working, what we refer to as *function*. When we are using MRI, we create images of what the brain is made of, what we refer to as *structure*. In combination, both techniques enable us to understand how the brain is working while we perform a cognitive task, experience an emotion, or simply rest and let our thoughts wander (Poldrack 2018). This interest in understanding how the brain works has been the motivation for many fMRI studies, as it is certainly one of the most challenging scientific enigmas to date.

WHAT DO WE MEASURE WITH IT?

Measurements with fMRI exploit the fact that nerve cells in our brain need to be constantly supplied with energy. This energy reaches the nerve cells through the blood vessels in the form of oxygen and sugar. When we perform a cognitive task or experience an emotion, certain regions in the brain become active and the nerve cells in these regions consume more

energy than in a state of no activation. This increased energy demand is in turn associated with an increased blood flow, which is measurable with fMRI via the magnetic properties of hemoglobin in the blood (Poldrack/Mumford/Nichols 2011).

HOW IS IT PERFORMED?

In order to create images of how the brain works using fMRI, we need to perform several measurements. In the beginning, we start with a solely structural measurement that maps the shape and structure of the brain. The structural images are needed so that the brain activation, which is measured during the functional measurements, can be overlaid on them to show its location in the brain (Soares et al. 2016).

After the structural measurement, functional measurements are conducted to obtain images of brain activation. Usually, brain activation is measured in two different states: in a state that we want to investigate and, in a state that we want to compare with the state of interest (Poldrack 2018). In our study, we are interested in how the brain is working while people see an avatar's face compared with brain activation while people see an actor's face. When contrasting both conditions, we can see which brain regions are active more strongly in response to an avatar's face or an actor's face.

WHAT DO WE EXPECT FROM OUR FMRI MEASUREMENTS?

In order to understand how the brain is working while people see an avatar or an actor's face, it is important to go back to previous studies investigating brain activation in response to human faces per se. Such studies have revealed that face processing relies on a bilateral network of brain regions in the temporal and frontal lobe of the brain (Duchaine/Yovel 2015, Haxby/Hoffman/Gobbini 2000): the fusiform face area in the fusiform gyrus, the superior temporal sulcus, and the inferior frontal gyrus. In our study, we can also show that these regions consistently become active when participants are looking at the faces of actors. A typical activation pattern is outlined in Figure 1 (showing in color and encircled).

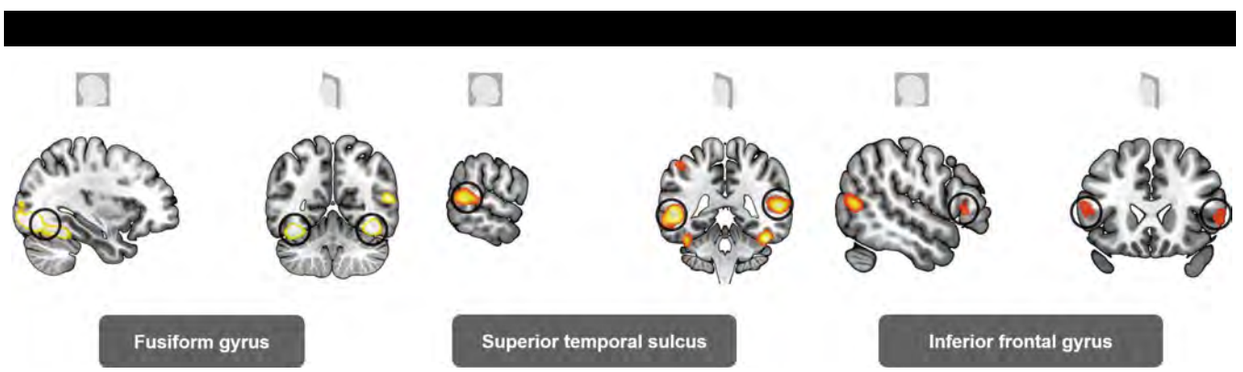

FIG. 1

ILLUSTRATION OF THE TYPICAL BRAIN RESPONSE TO HUMAN FACES. EACH IMAGE SHOWS THE BRAIN ACTIVATION OF ONE PARTICIPANT OF THE FMRI STUDY.

Previous studies have also shown that the amygdala plays an important role while people look at faces, especially when the faces show an emotional expression. The amygdala is essential to people's ability to feel certain emotions and to perceive them in other individuals (Adolphs 2008). Hence, it is bilaterally active in response to faces showing an emotional expression. Such a bilateral activation pattern in the amygdala of one of our participants is outlined in Figure 2.

If the amygdala or other regions in the temporal lobe are altered due to a neurological disease, the entire brain network that is active when people see a face may be affected. Previous studies have shown that this is the case in people with epilepsy that originates in the temporal lobe of the brain (Ives-Deliperi/Jokeit 2019). For example, it was found that the amygdala is less active in response to a human face in the brain hemisphere where the epileptic seizures originate compared with the amygdala in the not affected brain hemisphere (Ives-Deliperi/Butler/Jokeit 2017, Labudda/Mertens/Steinkroeger/Bien/Woermann 2014, Schacher et al. 2006; Toller et al., 2015). Therefore, a further aim of the fMRI study is to compare which brain regions are active while people with temporal lobe epilepsy (TLE) and people without epilepsy look at actor and avatar faces.

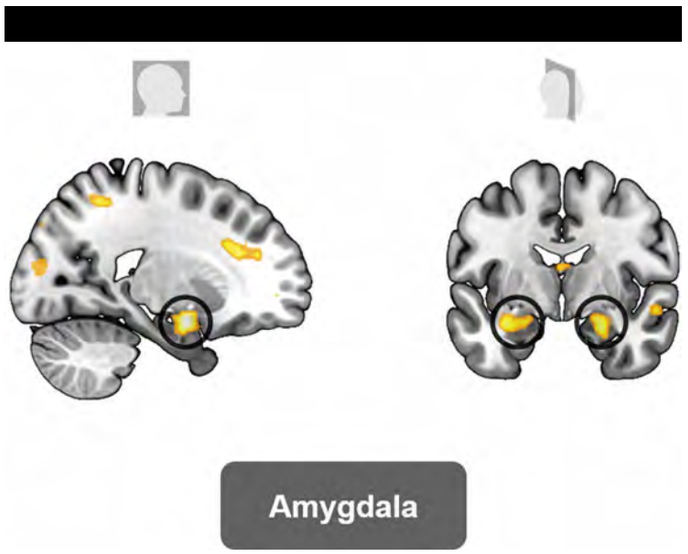

FIG. 2
ILLUSTRATION OF THE TYPICAL AMYGDALA RESPONSE TO HUMAN FACES WITH A FEARFUL EXPRESSION. THE IMAGE SHOWS THE BRAIN ACTIVATION OF ONE PARTICIPANT OF THE FMRI STUDY.

METHODS OF THE FMRI STUDY

For the study, we used a set of videos that have been developed in a four-step process in cooperation with the Zurich University of the Arts:

1. Fearful and neutral facial expressions were recorded from female and male actors.
2. For two female and to male actors, a customized avatar was created by a graphic artist to match their appearance.
3. By motion tracking, the actors' recorded expressions were conveyed onto their avatar faces.
4. The recorded material was divided into single videos of three seconds duration and the best 128 videos were selected to show during the fMRI measurement.

26 participants without epilepsy and 17 partcipants with epilepsy took part in the fMRI measurements. They were scanned with an MRI scanner of the Medizinisch Radiologisches Institut located at the Schulthess Clinic in Zurich. When lying in the MRI scanner, participants watched the videos of actor and avatar faces via a back-projection that was visible by a mirror above their eyes (see Figure 3; the table with the participant is positioned outside

the tube of the MRI scanner for illustration purposes). While images of the brain were created, participants were required to lie as motionless as possible inside the MRI scanner. The measurement took around 35 minutes. Before each video, a fixation cross was presented, so participants knew where the video would appear. After each video, a black screen was presented until the next fixation cross appeared announcing the subsequent video (see Figure 4 for illustration).

FIG. 3
THE FMRI SETTING AT THE EPILEPSY CENTER AT KLINIK LENGG, ZURICH.

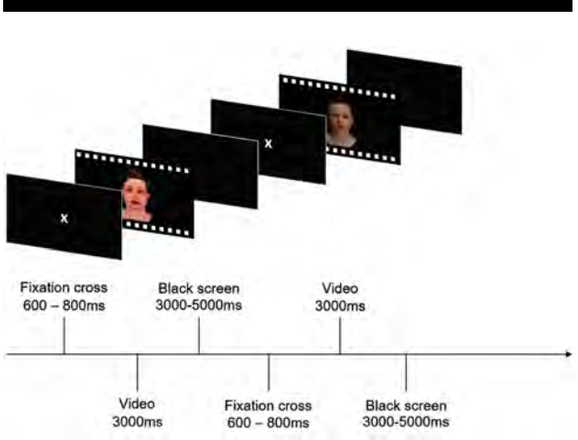

FIG. 4
ILLUSTRATION OF THE PROCEDURE OF THE FMRI STUDY

RESULTS OF THE FMRI STUDY

Before the results are outlined in detail, we want to summarize our three main findings. The first two findings are based on the results found in participants without TLE and the third finding is based on the comparison between participants with and without TLE:

1. While participants look at avatar faces with a neutral expression, the brain is active in a similar manner than when people look at faces of actors with a neutral expression.
2. While participants look at avatar faces with a fearful expression, certain brain regions are less active than when participants look at faces of actor with a fearful expression.
3. The difference in response to fearful avatar faces and fearful actor faces is smaller in participants with TLE than in participants without TLE.

Concerning the second finding, an activation difference between fearful expressions of avatars and actors emerges in the superior temporal sulcus and the inferior frontal gyrus. Both regions are sensitive to human faces and human facial motion, which also has been shown in previous studies (see again Figure 1; Duchaine/Yovel 2015, Haxby et al. 2000). In other words, avatar faces do not seem to activate these brain regions in the same way as their human counterparts. However, as the first finding shows, this difference between avatar faces and faces of actors is only present if the faces show an emotional expression.

When comparing the brain activation in participants with TLE to participants without TLE, we see that several regions that are associated with the processing of faces are less activated in participants with epilepsy. For example, the amygdala (see again Figure 2) of participants with TLE shows a smaller response to avatar faces and faces of actors with a fearful expression than the amygdala in participants without TLE.

SUMMARY AND OUTLOOK

In summary, some regions in our brain work differently when we look at actor faces than when we look at avatar faces. Furthermore, if epilepsy is present, it influences these brain activation patterns. It is likely, that these differences in response to avatar faces also have an influence on our behavior during interactions with avatars. This has important consequences for the use of avatars in various commercial and public applications and research. Interestingly, avatars and computer-generated characters in general are increasingly being used in diverse fields. As a result, with every day we become more experienced with such characters. How will this increasing exposure with computer-generated characters influence our behavior towards them? How will our brain adapt to this? At this point, we note that we currently have no answers to these questions and are in need of future studies to address this.

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AVATAR'S FACES IN EEG

TERESA SOLLFRANK

In our daily lives *emotions* play an important role in how we think and behave. The emotions we feel can compel us to take action and the recognition of emotions enables us to interact with others and adapt our behaviour to the circumstances. Particularly facial expressions contain a lot of information that allow us to interpret emotions and analysing the brain processes during recognition of different facial emotions (e.g. anger, happiness, fear) can help us to better understand emotion recognition and social cognition.

Sometimes the quality in emotion recognition can be diminished due to neurological diseases like epilepsy. In our study, we plan to compare the reaction towards fearful and neutral faces in actors and computer generated faces, so called avatars between healthy subjects and people who suffer from epilepsy. Our aim is to better understand the processing of emotion recognition in faces in the neural system and the effects of avatars on the quality of emotion perception.

EPILEPSY

Epilepsy is defined as a condition of recurrent unprovoked seizures that start in the brain. These seizures are brief lapses of attention or brief episodes of involuntary movement or sensations that may involve a part of the body, the entire body and are sometimes accompanied by loss of consciousness. Seizures are a result of excessive electrical discharges in a group of brain cells and the characteristic of a seizure depends on where in the brain the disturbance starts, and how far it spreads. The causes can be complex and sometimes hard to identify, but may include a genetic tendency or a structural change in the brain (e.g. a stroke, head injury or tumor). Around 50 million people worldwide have epilepsy, making it one of the most common neurological diseases globally. Usually medication with anti-epileptic drugs is the most important and common treatment, an up to 70% of the people can become seizure-free with medication. Other treatment options are for example brain surgery, deep-brain stimulation, vagus-nerve stimulation or a ketogenic diet.

Deficits in emotion recognition and social cognition are especially reported in people suffering from temporal lobe epilepsy (TLE) (Meletti et al. 2003, 2009, Bonora et al. 2011, Broicher et al. 2012, Amlerova et al. 2014, Steiger/Jokeit 2017). TLE is a chronic disorder characterized by recurrent focal seizures that originate in the temporal lobe of the brain. The primary functions of the temporal lobe are to process sensory information and derive it into memories, language, and emotions. Located within the temporal lobe are the hippocampus and the amygdala, which are part of the limbic system. The hippocampus manages the formation of new memories and communicates closely with the amygdala, which is responsible

for the processing of emotions. Parts of the temporal lobe (fusiform gyrus, parahippocampal gyrus) are needed for the processing of visual stimuli to allow us to recognize objects or faces. Our temporal lobes are essential to process emotional information and impairments in these structures seem to be connected to deficits in emotional perception.

ACTOR VS AVATAR

Investigating emotional perception in an experimental environment demands meaningful and realistic stimuli material. The quality of emotional information depends on the pictures and videos presented that contain facial expressions. Recent studies have already shown that it may be helpful to use avatars to examine and possibly enhance emotion recognition in a variety of conditions like autism (Bekele et al. 2014, Hopkins et al. 2011) and schizophrenia (Dyck et al. 2010). However, while emotional faces of avatars have been shown to elicit amygdala activation comparable to that elicited by human faces in healthy participants, responses to human faces in face-sensitive cortical structures were found to be significantly stronger (Moser et al. 2007).

IDEA BEHIND OUR PROJECT

The overall purpose of the EEG study was to learn about the basis of processing of dynamic emotional expressions in human as well in avatars.

In order to achieve this, we compared brain electrical responses elicited by fearful and neutral facial expressions of actresses/actors and their avatars. The evaluation of the difficulties associated with processing of facial expressions makes it absolutely necessary to use valid stimuli that fully capture the facial and emotion related information displayed in a face. However, most studies on the perception and recognition of facial expressions have used static pictures displaying different emotional expressions. Only few studies applied dynamic facial expressions, which are considered to be more ecologic and therefore closer to daily life (Sarkheil et al. 2013). Yet designing and generating dynamic facial stimuli poses the problem of controlling for temporal und figural properties of the face and the developing facial expression. A promising way to bypass this is the use of computer-generated avatars, which allow to form and systematically control important features of the facial expression. We hypothesise that there will be a significant differences in both people with epilepsy and healthy controls elicited by facial expressions of actresses/actors and their avatars.

The secondary objective was to differentiate between brain electrical responses of people with and without epilepsy to fearful and neutral facial expressions. In particular, we invited patients diagnosed with temporal lobe epilepsy to take part in our study. We hypothesise that the responses to fearful facial expressions are significantly reduced in people diagnosed with temporal lobe epilepsy as compared to healthy controls, as it has been shown in earlier functional MRI studies (Schacher et al. 2006, Broicher et al. 2010).

EEG: WHAT CAN YOU MEASURE?

At the root of all our thoughts, emotions and behaviours is the communication between neurons within our brains. The billions of nerve cells in your brain produce very small electrical signals that form patterns called brain waves while they communicate with each other. An 'electroencephalogram' (EEG) is a test used to evaluate the electrical activity in the brain and is considered by many to be one of the most efficient and relatively inexpensive methods for examining activity in the brain. It provides excellent time resolution, allowing us to detect activity within cortical areas, even at sub-second timescales. It tracks and records these brain wave patterns of varying frequency and amplitude, measured in voltage. These EEG waveforms are generally classified according to their frequency, amplitude, and shape, as well as the sites on the scalp at which they are recorded.

Our brainwaves change according to what we're doing and feeling. When slower brainwaves are dominant we can feel tired or dreamy. The higher frequencies are dominant when we are alert and awake. Altered brain waves can be measured in several types of brain disorders. For example, when epilepsy is present, seizure activity can appear as rapid spiking waves on the EEG. The EEG test can also be used to diagnose other disorders that influence brain activity, such as Alzheimer's disease or sleep disorders. Electrical activity in the brain can also be measured as a response to an external stimulation of e.g. sight, sound, or touch in an experimental condition. These are called evoked potential studies.

HOW IS IT USED?

A varying number of small flat metal discs called electrodes are attached to the scalp with a conductive gel, paste or dry. The majority of signals captured by EEG represent the summation of cortical pyramidal cells in the upper layer of the brain. The electrodes on the scalp are very sensitive and they detect these dipoles formed by ten to fifty thousand neurons. EEG poorly measures neural activity that occurs below the upper layers of the brain (the cortex). The charges picked up by the electrodes are amplified and send to a computer that records the results.

The electrical impulses in an EEG recording look like wavy lines with peaks and valleys (fig. 1). Analysing these data can get quite challenging. Signal processing, artefact detection and attenuation, feature extraction, and computation of mental metrics such as workload, engagement, drowsiness, or alertness all require a certain level of expertise and experience to properly identify and extract valuable information from the collected data.

FIG. 1

EXAMPLE OF EEG SIGNALS. EACH LINE REPRESENTS THE SIGNAL MEASURED AT A SPECIFIC ELECTRODE LOCATION ON THE SCALP.

THE STUDY

We invited 10 healthy controls and 10 TLE subjects to participate in our study. Subjects sat in front of a screen in a comfortable position, watching videos and pictures of the actresses/actors and avatar stimuli material while continuous EEG signals were recorded with twenty-one sintered Ag/AgCl scalp electrodes that were placed on the head of each subject (fig. 2).

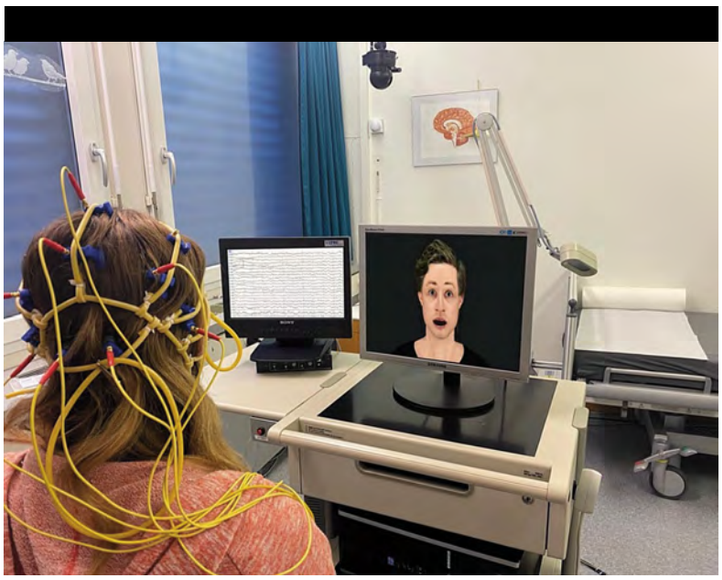

FIG. 2
EXPERIMENTAL SET-UP AT THE EPILEPSY CENTER AT KLINIK LENGG, ZURICH.

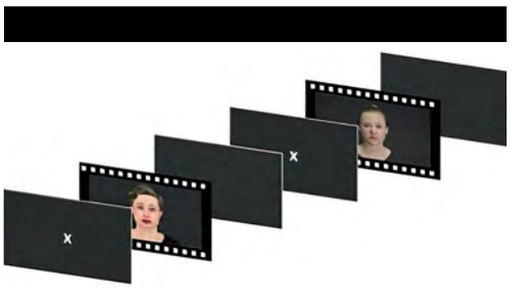

FIG. 3
STIMULI ITERATION. EACH SINGLE ITERATION OF A FIXATION CROSS FOLLOWED BY THE VIDEO/PICTURE FOLLOWED BY A BLANK SCREEN IS LABELLED AS A TRIAL.

PROTOCOL

In the first part of the experiment subjects watched 120 brief videos (2–3 sec) of faces of actresses/actors and their avatars showing neutral as well as fearful faces on a computer screen in randomized order, separated from each other respectively by 4sec of blank screen with a fixation cross in the middle of the screen (fig. 3).

Afterwards subjects did a second round with the same sequence but videos were replaced with pictures that have been taken from each clip. To keep subjects engaged, they were asked to perform an attentional task by pressing a button during a specific control condition.

RESULTS

For analysing the EEG datasets, the trials for each condition (ACTOR neutral, ACTOR fear, AVATAR neutral, AVATAR fear) are averaged and the signal is processed.

Is there a difference in the brain electrical response between watching actresses/actors and their avatars?

EEG signals were measured while subjects watched subsequent pictures of actors and their avatars with neutral and fearful facial expressions. The trials of each condition (i.e. actor or avatar with neutral/fearful faces) were then averaged to measure the specific brain response to the different faces, this response is called an event-related potential (ERP).

As an example, the measured EPRs to the four different conditions of 5 healthy volunteers are shown in fig 4. The waveform represents the time locked reaction of the brain (measured over CZ) within 1000 ms after the pictures are presented. The blue waves show the reaction to faces of actors with neutral (light blue) and fearful (dark blue) expression, the red curves the reaction to faces of avatars with neutral (light red) and fearful (red) expression.

We can see a fast reaction to the different stimuli within only 100–200 ms after presentation and the waveforms seem to differ after 200 ms dependent on whether the picture of an actor or avatar is presented. A more long-lasting change between the different curves is seen after 300 ms.

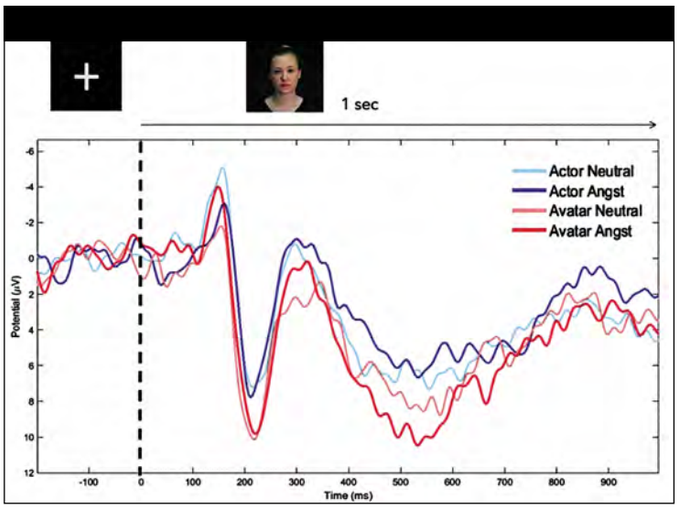

FIG. 4

EPRS TO THE FOUR DIFFERENT CONDITIONS ANALYSED FOR 5 HEALTHY VOLUNTEERS.

Is there a difference between brain electrical responses of people with and without epilepsy to fearful and neutral facial expressions?

EEG signals were measured while subjects watched the 120 video clips and subsequently the trials of each condition were averaged. Afterwards a so-called time-frequency spectrum (fig. 5) was computed, where we calculated the intensity of power (dB) in each frequency over the period of time while the subjects watched the videos. As an example, we can have a closer look on the condition ACTOR fear. The more activated the brain, the more power is produced and the more intense the colours of the heat map become. The intensity of activation is more pronounced in healthy subjects compared to the epilepsy subjects in our study.

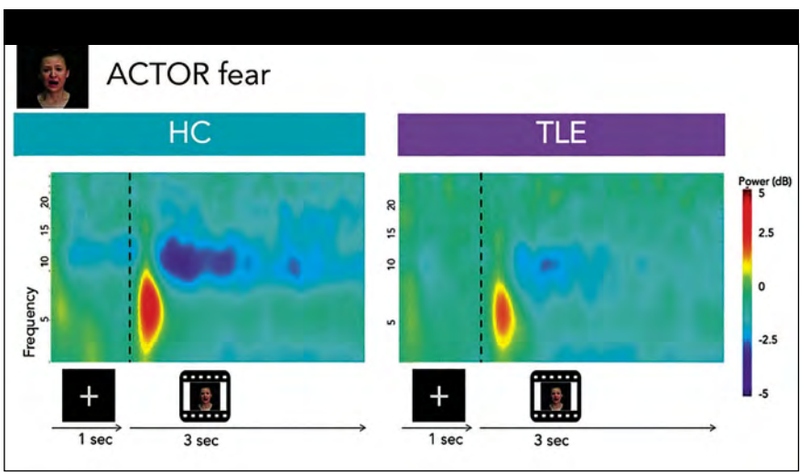

FIG. 5

TIME-FREQUENCY SPECTRUM OF POWER AT A CENTRAL ELECTRODE.

HC= HEALTHY CONTROL GROUP, TLE = SUBJECTS WITH TEMPORAL LOBE EPILEPSY. THIS IMAGES WERE CALCULATED FOR ELECTRODE POSITION C4.

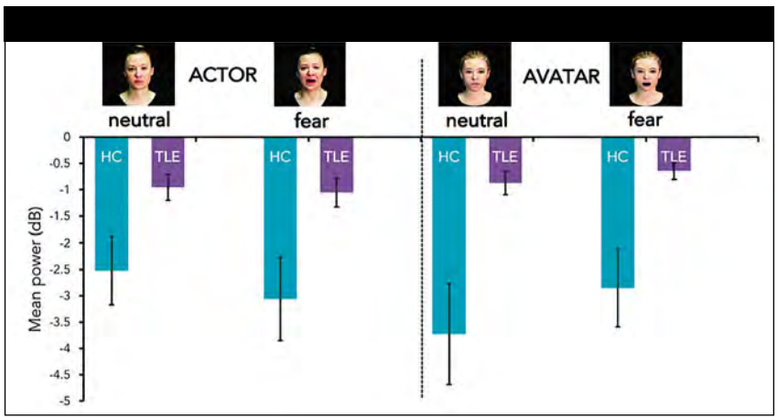

FIG. 6

POWER VALUES OF ALL CONDITIONS FOR HEALTHY AND TEMPORAL LOBE EPILEPSY SUBJECTS.

THE VALUES WERE MEASURED FOR A TIME WINDOW OF 500–2000 MS IN THE FREQUENCY RANGE FROM 8–13 HZ.

In a second step, we are able to transform the values of these heat maps into a numeric value during a specific time window (500–2000 ms) and frequency range (8–13 Hz) for all conditions. These values of power reflect the intensity of electrical response and the results are depicted in fig. 6. The responses to fearful facial expressions seem to be reduced in people diagnosed with temporal lobe epilepsy as compared to healthy controls.

CONCLUSION

So far the EEG measurements suggest that the faces of actresses/actors are perceived different than faces of avatars not dependent on a fearful expression. Fear in faces of actors seem to affect us different than in faces of avatars although further analysis is needed.

In previous studies a reduction in brain electrical activity during emotional perception could be seen in epilepsy patients (TLE). Our preliminary results are reinforcing these findings for fearful facial expressions. In total, we are aiming for a group size of 26 subjects to have statistically meaningful results. Measurements are ongoing and results will be shared with the academic community by publishing an article in a topic related scientific journal.

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“DOPPELTGÄNGER”. BODY DOUBLES, OR THE SHADOW AND HIS EGO

MICHAEL MAYER

“Oh what is that grazing the banister?
Is that not how I looked out the looking glass?
And those are my limbs—how dazzling!
Now it lifts up its hands, like tufts of yarn.
That’s the line of my brow and my curls,—
Woe, am I mad, or is my end drawing near?”

ANNETTE VON DROSTE-HÜLSHOFF,
DAS FRÄULEIN VON RODENSCHILD, 1842

FIG. 1
FRIEDRICH HUNDT,
PORTRAIT OF ANNETTE VON DROSTE-HÜLSHOFF
DAGUERREOTYPE, 1845

1 “It was a little before eight o’clock in the morning when Yakov Petrovitch Golyadkin, a titular councillor, woke up from a long sleep.” (Dostoyevsky 1951: 477) That is the opening of the novel *The Double,* which the young Dostoevski published after the runaway success of his debut, *Poor Folk* (1846). The novel’s beginning is unspectacular—unlike the events to follow. The book’s action spans four days of a rainy, cold November in mid-nineteenth-century St. Petersburg. To summarize: at a party, on a renewed attempt to win the favor of Klara Olsufyevna Berendeyev—a young woman from an élite family whom he venerates—Golyadkin is publicly humiliated and expelled from the house. In deep despair, vexed by self-recrimination and suicidal thoughts, he wanders around nighttime St. Petersburg for hours. Finally, he catches sight of a lone pedestrian who strikes him as strange and uncanny. Acting on a spontaneous impulse, he follows the stranger all the way to the man’s apartment, which—to Golyadkin’s great surprise—turns out to be his own. His sense of foreboding soon bears out:

> *The stranger, also in his coat and hat, was sitting before him on his bed, and with a faint smile, screwing up his eyes, nodded to him in a friendly way. Mr. Golyadkin wanted to scream, but could not—to protest in some way, but his strength failed him. His hair stood on end, and he almost fell down with horror. And, indeed, there was good reason. He recognized his nocturnal visitor. The nocturnal visitor was no other than himself—Mr. Golyadkin himself, another Mr. Golyadkin, but absolutely the same as himself—in fact, what is called a double in every respect.* (Dostoyevsky 1951: 515)

After some initial hesitation, the original Golyadkin invites his alter ego to spend the night. Despite their early apprehensions, the two of them pass the evening in a more relaxed, almost amiable mood. In the process, it emerges that the double is not only identical to Golyadkin in every way, but he even comes from the same area, has the same name, and finally—as we learn the next day—works in the very same department of the civil service, where he is greeted warmly as a new member of staff. Although conversations with colleagues indicate that they have noticed the unusual duplication of person and name, this is not further remarked upon. Within several days, the "real" Golyadkin's hopes for a mutually beneficial relationship with his alter ego fall apart. The "fake" Golyadkin grows increasingly rude, scheming, and at last openly malicious. A disastrous rivalry develops between the original and the copy, between Golyadkins I and II, a battle that Golyadkin I ultimately loses. His doppelgänger wins out as a successful second edition; Goldyadkin I had previously only dreamed of winning his colleagues' sympathies and his boss's recognition. All his attempts to defend against being gradually displaced from his own life are in vain.

Yet that is not all. At another soirée at the Berendeyevs' parlor and in front of the daughter, with whom Golyakin is secretly in love, the situation derails altogether. Golyadkin is publicly exposed and sent away once and for all. Several gawkers run alongside the carriage that is carting him off. One by one, they fall behind, leaving only a single man, "Mr. Golyadkin's unworthy twin":

> *With his hands in the trouser pockets of his green uniform he ran on with a satisfied air, skipping first to one and then to the other side of the carriage, sometimes catching hold of the window-frame and hanging on by it, poking his head in at the window, and throwing farewell kisses to Mr. Golyadkin. But he began to get tired, he was less and less often to be seen, and at last vanished altogether*
> *(Dostoyevsky 1951: 614).*

The doctor, who is alongside Golyadkin in the carriage, pronounces—like "a judge's sentence"—that he is being confined to an institution. The novel ends with Golyadkin shrieking.

2

Dostoevsky's novel was an unexpected flop with readers, and the critics tore it apart. Yet he maintained mixed feelings about it. Throughout his life, he viewed it as a failure, but still he wrote that "its idea was rather lucid, and I have never expressed in my writings anything more serious." (Dostoyevsky 1919: 883) Aside from the complex form and portrayal, the novel has some unusual features that, to my knowledge, have never been examined in the context of the doppelgänger motif. This doppelgänger does not simply disappear at the end. He is left behind. By the time the original Golyadkin is sent away, his clone has fully taken over his life—his personal, professional, and social position—and takes his place as an improvement on this original. Golyadkin II has utterly absorbed Golyadkin I. If the doppelgänger—or indeed *Doppeltgänger* (doubled-goer), as the German word is spelled in the Grimm Brothers' famous dictionary—is a person who can "appear in two different places at once"—Dostoevsky resolves the conflict between them not only by segregating the two editions of the same person in separate locations, but by

making one of them literally vanish from view: Golyadkin I, as an institutionalized patient (Grimm 1860: 1263). Golyadkin II is left behind as an ambitious bureaucrat. The struggle is over, and the roles of winner and loser have been clearly assigned.

The agonal confrontation between a self/ego and its doppelgänger is already visibly deviating here from its antecedent in German Romanticism. Specifically, E.T.H. Hoffmann invoked "internal struggles" waged by "some dread power which endeavors to destroy us in our own selves" against those very selves, so as to externalize that internal struggle and to project it into the real world as a feud between two symmetrical, mirror-image combatants (Hoffmann 2008: 14). Thus, the doppelgänger figure appears to presage the "nuclear fission of the ego" that the individual (Greek *átamos)*—following the literal meaning of "indivisible"—would undergo in the twentieth century and from which it would never fully recover.

Indeed, beginning with the turn of the nineteenth century, these sorts of doubling fantasies seemed to run rampant: besides in the work of the authors already mentioned, they could be found in the pages of Jean Paul, Heinrich Heine, Theodor Storm, Edgar Allen Poe, Oscar Wilde, and others. The identical replication of oneself becomes an occasion to investigate what is presumably the most familiar, the *self,* as the stage of radical *self-estrangement* (Freud 2001: 3696). Of course, Sigmund Freud saw in this the workings of the unconscious that governs our minds. Specifically, he considered the "recurrence of the same thing" to be "what achieves such an indubitably uncanny effect," as expressed most prominently in the doppelgänger motif (Freud 2001: 3696). Drawing on Otto Rank (1993), he stresses the fundamental ambivalence toward the doppelgänger, who seems, on the one hand, to threaten the ego and the ego identity, but on the other to provide "insurance against the destruction of the ego" through duplication (Freud 2001: 3687). We see this ambivalence, a classic symptom of any psychiatric condition, at the beginning of Dostoevsky's novel in Golyadkin's ambivalent relationship with his clone, which, over the course of their first encounter, vacillates between a diffuse apprehensiveness and hopes of friendly coexistence. Only after the behavior of Golyadkin's double grows increasingly hostile does the nature of their relationship become clear. The duplicate becomes a lethal threat, the "evil self." Hence, the doppelgänger motif took on another attribute: a qualitative discrepancy between good and evil that would culminate forty years later in Robert Louis Stevenson's *Strange Case of Dr. Jekyll and Mr Hyde* (1886), which became world-famous in both literature and film. However, in Dostoevsky's novel, the complete absorption of the original by his update, who has been strategically and professionally optimized, raises a host of questions that I cannot altogether untangle here. I would therefore like to outline at least one of these questions and reflect on it analytically in light of our own time.

3

Scholars of literary, cultural, and media studies were quick to notice the temporal proximity between the emergence of doppelgänger themes in Romantic Era prose and poetry and the invention of photography in the early nineteenth century (Starl 2011). As early as 1844, the Westphalian poet Annette von Droste-Hülshoff associated a ghostly encounter with a doppelgänger with "Daguerre's pictures" in her poem "Doppeltgänger." (Droste-Hülshoff 2014: 384) People were once shocked by the optical-chemical production of their own likenesses in daguerreotypes and, later, the limitless reproducibility of such likenesses through photography. The very capability of freezing any moment in time and consigning it to some pictorial medium provoked a rupture in the epistemic regime of an era that was beginning to blur the lines between visibility, recognizability, and reality. Meanwhile, the capability of creating a photographic likeness of myself transferred this rupture to the inner workings of human psychology. Ever since then, we have been confronted by something at once foreign and familiar, someone who is both *me* and *not me.* Golyadkin's cry—"Or pretend that I am not myself, but somebody else strikingly like me … Simply not I, not I—and that's all" (Dostoyevsky 1951: 481)—could just as easily be a reaction to seeing his own photographic likeness. As late as the waning twentieth

century, in his final and perhaps most beautiful book, *Camera Lucida,* Roland Barthes was still invoking the "profound madness of Photography," pointing to "the advent of myself as other: a cunning dissociation of consciousness from identity." (Barthes 1981: 12–13) This is a reaction we have by now learned to repress. But to this day, even when looking at trivial snapshots, we still feel a remnant of that same animal horror that runs through Golyadkin's bones when he encounters his double. Barthes refers to "that faint uneasiness which seizes me when I look at 'myself' on a piece of paper," the same reaction that Siegfried Kracauer described as a "shudder" some fifty years earlier:

> ***A shudder runs through the beholder/viewer of old photographs. For they do not make visible the knowledge of the original but rather the spatial configuration of a moment; it is not the person who appears in his or her photograph, but the sum of what can be deducted from him or her. It annihilates the person by portraying him or her, and were person and portrayal to converge, the person would cease to exist.*** *(Kracauer 1993: 431)*

The culture of photography has never quite shaken off that uneasiness. The equivocal sensation that can always accompany a glance at one's own photographic likeness points to that same dualistic/duellistic confrontation that ultimately ruins the titular councilor Goldyakin, and which Kracauer takes to be a literal and overt threat of annihilation. The cryptic relationship between photography and death — around which Roland Barthes relentlessly circled without ever quite pinning it down — eventually escalates, in *Camera Lucida,* to the question of the dead man who confronts us through his picture as someone living/dead (Barthes 2002, 87). Barthes uses the term "punctum" of time to designate that enigmatic simultaneity that pervades the photo of the living/dead man: "He is dead and he is going to die … " (Barthes 1981: 95–96) This was Barthes's well-known caption beneath Alexander Gardner's photograph of Lewis Paynes, which was taken in 1865 shortly before Payne's execution for his attempted assassination of the US Secretary of State. These words are certainly paradigmatic, but they point to the testimonial nature of a recording medium (which may well apply to all recording media) that shows the viewer a person who *is going to be dead.*

And yet — and here we move slightly beyond Barthes's horizons — a photographic depiction of myself confronts me not only with death and mortality in general, specifically someone else's, but most of all with my own. What faces me in the photographic depiction of myself is *me — as the dead man I am going to be.* The "crisis of death" — which, in Barthes's view, began "in the second half of the nineteenth century" and must have been connected to photograph — perhaps takes on a different contour if we juxtapose the "punctum" of time with that singular gaze that I direct at my own likeness (Barthes 1981: 92). What it reflects is not in fact another self distinct from me, but myself as the dead man I will someday be, as seen through the eyes of someone else I will never be: *I am dead and I am going to die.*

4 Who was it who said that the nineteenth century dreamed up the monsters that came true in the twentieth? Apparently, the twenty-first century is taking this a step further. A concluding remark on that point. It seems to me that in this age, when my self is digitally producible as a virtual avatar in infinitely emulatable environments, the doppelgänger motif is becoming virulent within humans' lived experience and realities in a new and unsettling form. After all, especially since the worldwide spread of the smartphone in the 2010s, we are now constantly synchronized with digital copies of ourselves. In real time, our behavior is compared with and fed back into behavioral patterns extrapolated from it. And moreover, via this copy, we are also confronted with digitally optimized versions of ourselves, compared to which we are chronically failing short. *The digital version sets the standards.* And, slowly but surely, it takes the place of its analog original, from which it was abstracted, so as to reflect an inferiority that confronts it vis-à-vis its digital version.[1]

1 For more on this, see Meyer-Drawe (2018), 26f.

If mathematical game theory took the economic concept of competition as the "enmity between individuals" (Engels 1975: 423) who are artificially atomized and pitted against one another, then transferred it to a playing board so to formalize it, standardize it algorithmically, and universalize it as calculated routines of human behavior, these theories' digitalization and automation via AI-based specialized systems have ultimately shifted this enmity inside our selves. The social sphere is rendered competitive and hostile following the same process applied to the psyche, which now begins to compete with itself *within* itself (see Galison 2001). The market, whose rules were elevated in the mid-twentieth century into a guiding principle of knowledge and then to a practical regulating force for the social sphere, is mutating into the per-formative force of a subjectivity whose creeping market-ness is completing and perfecting the economization of societal, political, social, and finally natural life.[2] And if ethics — at least in the Classical sense, upon which Nietzsche and, in his own way, Foucault built — implies that art is "friends with itself," then a human being as self-enemy is quintessentially non-ethical. Dostoevsky's Golyadkin character seems like an earlier prototype of this human being whose *self-enmity* will bear radical implications for the question of the subject, its relationship to itself, to the environment, and to the larger world. It is as though we no longer trust the ground under our feet and have likewise lost faith in the starry sky overhead, our own kind, and ultimately our very selves. It is dizzying to contemplate: "At the same time Mr. Golyadkin felt as though the ground were giving way under him, as though he were staggering, falling." (Dostoyevsky 1951: 505)

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2 I have started to distinguish this process using the neologism "homo oeconomicus ludens." See Mayer 2020.

THE AVATAR'S BODY IN GAME SPACES

STEPHAN GÜNZEL

The phenomenological concept of corporeality is based on the assumption that the body is the medium that constitutes space and enables experience: the fact that people have a face, which is why they encounter space head-on, and usually stand on two legs, which makes them stand upright in space, and that they have a symmetrically organized body that allows them to qualitatively differentiate between two sides, defines, according to phenomenology, their specific anthropological status. The human body can therefore rightly be referred to as the schema or "archetype" of space, in so far as it determines how space appears to the individual and thus how spatial perception or the extent to which perception is spatially structured.

The medium of the body can even be spoken of in the full sense of the word, since the body medium is in the "middle" in so far as it forms the central starting point for the experience of space; but the human body is not to be thought of as a mere mediating instance that confronts the inner realm of thought or rationality on the outside, as René Descartes' separation of *res extensa* and *res cogitans* suggests. In other words: the mediation performance assumed from the phenomenological side has absolute validity and forms the basis of perception; it is not, for example, deviant from reality because it only mediates certain aspects or makes the world accessible in perspective sections. Rather, according to the phenomenological view, the perspective is part of reality, the "being-in-the-world".

This does not mean, however, that human perception is limited to a way of being-in-the-world. — On the contrary, the body schema as the archetype of space can also be modified; and this is precisely what technical media, above all image media, make possible: they can, for example, extend or limit the range of the body. Rather, the same can be assumed for technical media as for the body: even technically mediated structures are not inferior to what they represent but show something in a special form. In other words, for media such as images in particular — phenomenologically speaking — *what* they show is of less interest than *how* they show it.

From an ontological point of view, however, a representation can have less to do with being than with what is represented, since a picture only shows visible qualities, but not the tactile or olfactory qualities of things. The "increase in being" (Gottfried Boehm) inherent in the picture, if it does, is derived solely from the form of how a content is present: the kind of artificial presence can deviate significantly from the way the picture subject appears in its actual appearance. Such a phenomenological view of images can already be found among the producers of images, especially among painters who understand their activity as an exploration of perception.

According to Maurice Merleau-Ponty, what is special about a still life by the post-impressionist Paul Cézanne's, for example, is not that he paints apples on plates with a jug of water next to them, but that he paints the plate and the water vessel in a slightly a-perspectival manner — thus showing a visual situation, in which one sees the apple on the plate and the front of the jug from the point at which the picture places the viewer through the perspective of the picture, and at the same time slightly obliquely from above onto the plate and into the opening of the jug, both of which are rather round than elliptical. Cézanne has thus painted "something", which in psychology is called "constancy of form", and this means that a person's perception is not based on a momentary mono-perspective ("photographic") view of things, but on experience of the object: and part of this experience is that plates and jugs are usually round rather than elliptical. Cézanne has therefore chosen the mode of her life-worldly experience as the form of representation of things and it is this mode — the *how* of representation — in which the still life differs from a photograph of an identical arrangement. Cézanne is thus a special case of modern art because he does not attempt to go beyond the structure of life-world experience and produce self-referential or self-critical images, as was the case in Cubism, but rather to give the experience of space a formal expression in the picture.

FIG. 1
ATURE MORTE AVEC POMMES,
PAUL CÉZANNE

But it is not only painters who can modify the how of bodily and spatial perception in the picture or — as in the latter case — try to emphasize particular aspects of it by modifying it; even the imagination allows everyone to vary the configurations of the spatial scheme of frontal direction, upright walk and left-right difference and thus to modify the "archetype" of space. Thus, through imagination, it is possible to imagine what it is like not to stand but to crawl, i.e. not to have any experience of the vertical.

In contrast to Cézanne's times, today it is no longer possible to modify the way an object looks by means of a static or merely moving picture, but rather to make it look like an object: There are images that can be varied by the viewers themselves. Simulation images can be used to visually experience what it is like to steer a train or fly an airplane and thus conquer the vertical in a full sense. While the reception of these images was initially reserved for only a few people (such as pilots or scientists), in recent decades they have found their way into our homes and especially children's rooms in the form of computer games.

Although computer games are also means of play, they are first and foremost images of a special type: Their reception requires that they are not only viewed, but that they also interact with the visual phenomena via the incorporation of an avatar and the properties of it's body. This applies primarily to those games that convey an interactive spatial image and thus — due to their interactivity or the real-time generated representation of the interaction result — provide a navigation scheme that takes over the function that the body has in real space orientation. Computer games, as simulation images, are thus media which, like the human body, structure and enable a specific spatial experience. Their basic feature is that of spatial navigation.

Of course, the body as the archetype remains a reference point also for the avatar and the physical constitution of space the standard of comparison for a user of simulation images; but regardless of this, simulations can also provide completely foreign ways of experiencing things such as flying, which no one should know from their own physical experience. Flying or hovering have been used as perceptual modifications in cinema films, but for the first time the simulation image offers the possibility of navigating by oneself.

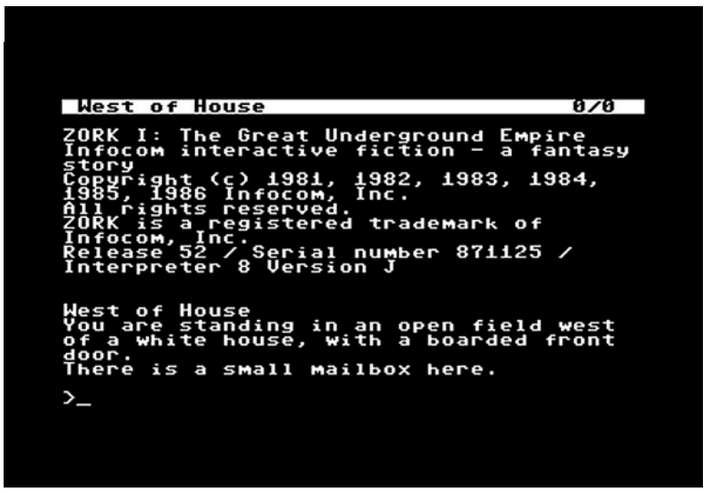


FIG. 2
ZORK (1980)

No film image, no matter how sophisticated, can create the impression in viewers that movement is induced by them. This is the principle of computer games. From a phenomenological point of view, those options are particularly important which are not in clear contrast to the extra-pictorial perception, but which are rather variations or radicalizations of the experience of the body.

A radicalization is represented, for example, by the game ZORK from 1980, which represents the body schema as such in its essence. The game, which belongs to the group of so-called text adventures, is varied solely through the input of text and is thus already a borderline case of the image: the image itself contains no pictorial representations of a space (fig. 2). In response to a description of a situation, players are asked to enter text, which consists mainly of control commands and subsequently triggers a spatial movement, which in turn can be derived from the new description of the situation. Despite this text-based approach, the game is not about conversation with a virtual counterpart, but about navigating through a virtual space (fig. 3).

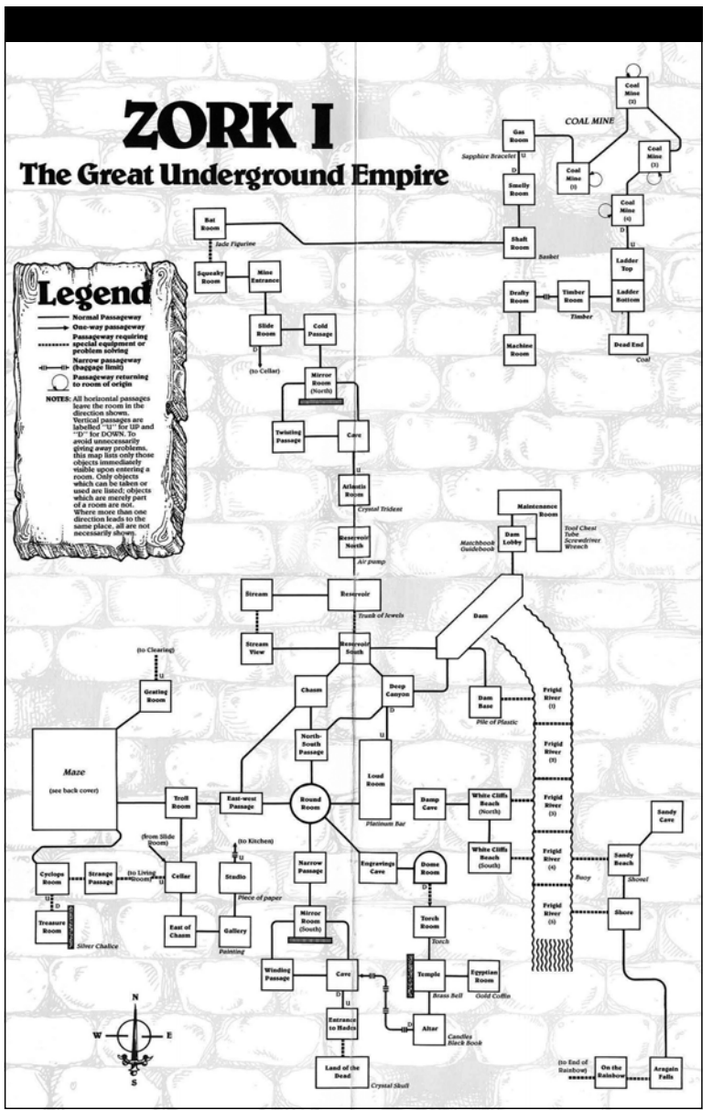


FIG. 3
MAP OF *ZORK*

In the computer game, the continuous movement as it is made possible by the medium of the avatar's body (or in this case: location) is reduced to essential movements: In fact, topological navigation comes close to a phenomenological description of the human body, in so far as it is characterised by continuous movement, but, according to the phenomenology of the body, this also occurs between excellent directions along cardinal axes to the front or to the side. The only difference is that a movement can be repeated identically in the text adventure, whereas in the real world it can only be repeated differentially and results in similar but not identical movements of place. Only the statistical means of lifeworld movements would produce a space that can be called a "hodological space" by Kurt Lewin's environmental psychology. The text-adventure ZORK therefore allows the space of decisions to be experienced as a pure hodological space. In this space it is no longer relevant how the users of the space get from one point to another, but only how they decide to go. At most, the aim of the game can be to traverse the labyrinth in the shortest possible way and to make the topology of the space itself the object of spatial action.

Contrary to the hodo-topological spatial experience or movement, games of the First Person Shooter type largely approach the physical scheme of the human being, even though these also make a phenomenological reduction and, like text adventure, are based on spatial navigation possibilities that are topologically limited. They are different in terms of their visuality: Whereas in ZORK a black screen with bright

letters could be seen, in games like DOOM a perspective view of space is given, i.e. players interact with an "egological" view (fig. 4). Accordingly, both genre names are derived from the subjective viewpoint that is the style of this spatial image, whose *how* consists in the central perspective and representational representation of its *what*.

FIG. 4
DOOM (1993)

In contrast to a text adventure, a first-person shooter has a flowing or continuous spectrum of movement, so that in terms of navigation it is in one case an "analogue" screen game, in the other a "digital" one, although both are digital games in the technical sense. Nelson Goodman in *Languages of Art* from 1968 had already distinguished between "analog" and "digital" in the sense of density and discontinuity of a representation. This understanding can also be applied to interactive images: In the case of ZORK there are distinct, clearly distinct options (either "north" or "south" or "west" or "east"), in the ego-shooter, on the other hand, there is the continuous, grazing movement, in only vaguely defined directions. Accordingly, a compass is usually displayed in the game image or the game has its own map mode, with which or in which the primarily only approximately determinable directions can be subsequently concretised—and transferred into a "digital" determination. The experience of the "analogue" simulation picture ego-shooter can therefore come very close to the experience of space in the real world, as even people can only approach the points of the compass and GPS despite the aids they use, precisely because their being is physical.

The difference between the "real life" situation and that in the game is therefore not, as in the case of the text adventure, the difference between "analogue" and "digital", but rather the limitations and extensions of analogue spatial behaviour. To illustrate these variations two ego-shooters can be compared: One is the already mentioned DOOM from 1993 and its successor QUAKE from 1996 and its sequels (fig. 5), both of which contributed significantly to the commercial establishment of the genre.

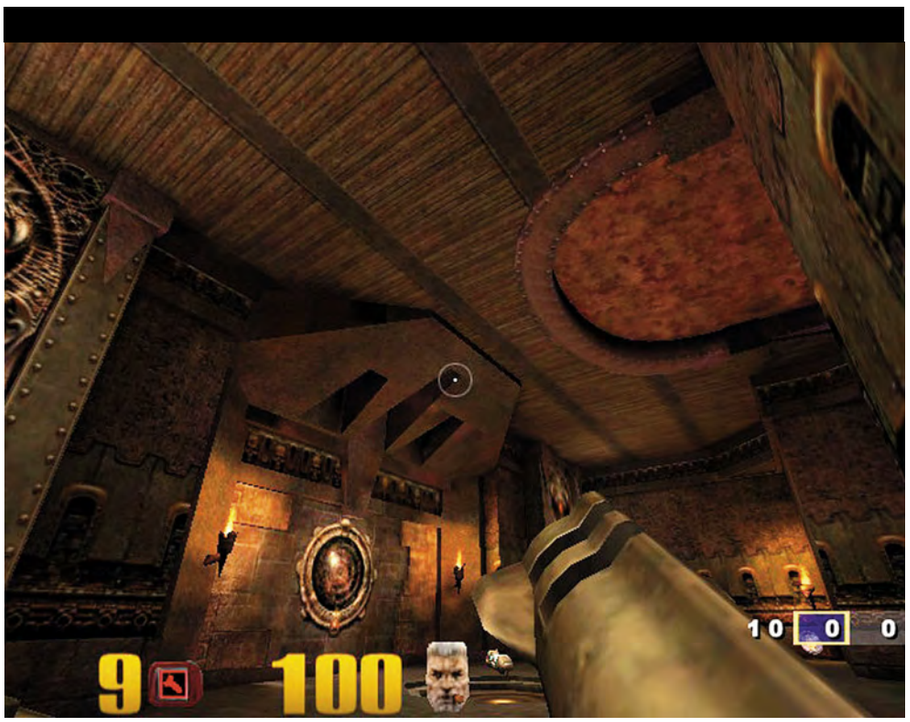


FIG. 5
QUAKE ARENA III (1999)

Only in QUAKE was it possible to perform a movement in all three visible dimensions of space. In contrast to this, DOOM was designed in such a way that the user could only navigate with the avatar's body or location along the horizontal axes of movement, even if the space was already three-dimensional or in depth perspective as a picture view. In this way, the image movement in DOOM was reduced to the two axes of the plane, whereby the primary lateral movement could be carried out in two ways: as a rotation around the vertical axis of the virtual body (clockwise or anti-clockwise to the right or left) and as a direct lateral movement. The latter in particular, as an excellent movement, is the secondary one in the game. This takes into account the fact that people also turn primarily in their everyday lives in order to take a different direction and do not move directly sideways to get to the right or left. Thus, the keys used in DOOM to move sideways are not located in the area of the other four keys on the input interface, where the relevant movement commands are given using the cursor keys [↑], [↓], [←] und [→]. The last two "mean" spatially then not "directly left" or "directly right" but the respective rotary movement. The direct sideways movement, on the other hand, is performed using the [,] keys for "left" and [.] for "right".

All in all, the movement spectrum of DOOM is thus limited to navigation in the surface, which is paradoxical in that a surface has no extension and is therefore not space. At least this applies to the Euclidean conception of space. With the Non-Euclidean geometry, however, the paradox can be resolved: For example, with his *Theorema Egregium* the mathematician Carl F. Gauss in 1827 claimed, that the surface of the earth itself can certainly be regarded as a space, since it is not completely flat due to its curvature. In Euclidean geometry, the surface is a special case of space: a two-dimensional space. Thus, phenomenologically speaking, the spatiality of the human life-world is composed like an early ego-shooter game like DOOM in which the possibilities of movement of a planar being are simulated and only navigation in the plane is possible. The third dimension is only given here as a fiction: Even if the view of the room is given in "3D" and upright figures as well as walls and ceilings can be seen, the first person shooter cannot raise his gaze and look at the ceiling from the front or even look into the sky.

The vertical change of view was only possible in QUAKE, which in turn required a change in the input: body and eye, which were still identical in DOOM insofar as they were moved at the same time, had to be controlled separately from now on: Thus in QUAKE the body of the avatar is still controlled with the left hand via the keys [W], [A], [S] and [D] in the topologically limited space of the surface, whereas the head is moved with the right hand via the computer mouse, insofar as the back and forth movement with the input device (which itself is moved in the surface) causes an up or down movement in the picture.

For the movement, this Cartesian division of head and body or body and eye resulted in the fact that the lateral movement is no longer regulated by the keyboard alone, but primarily by the turning of the gaze, in so far as the previously marginalised evasive movement, which leads directly to the left or right, is now transferred to the central area of body control, but the rotational movements around the vertical axis now result from the combination of the turning of the gaze (lateral movement of the computer mouse) and movement along the Z-axis of the picture space—i.e. in the dimension of its depth. In return, the evasive movement is raised to a tactical principle. These changes increase the demands on the players to act and spatially orient themselves in the image space of an ego-shooter. This means that even if the simulation supposedly approaches the physical scheme of the life-world experience, the game image varies considerably due to the interaction, thus forming not only an own style of representation but also an own spatial experience.

THE AIS HAVE IT? HACKING INTO THE AI AVATAR DREAM[1]

ALEXANDER GERNER

1. TOWARDS THE AI AVATAR DREAM

Avatars, artificial persons, or graphic placeholders for human beings are used in various functions in today's *cultures of digitality*. Avatars range from cartoon figures—starting with "Clippy," the famously annoying Microsoft Word paperclip assistant whose googly eyes watch our moves on the screen—to virtual workforce employees, social partners, and programmed AI therapists. With avatars, we have to heed the *disappearance of computers in society* in the quest for digital humanity (Simanowski 2019: 3) by criticizing mere data-driven media and their cultural analytics (Manovich 2020) as models of AI avatar aesthetics.

The avatar as a model of subjectivity has been described as a virtual proxy and representative of a real person (Little 1999; cf. Gunkel 2010). Others focus on a prosthetic avatar as a puppet or homunculus double (Apter 2008) of agency in a technical milieu, including cybertherapy (Gerner 2020).

The *avatar dream* (Fox Harrell and Lim 2017), when integrated with the two other culturally shared visions of future media of technological dreams using the computer and algorithms—the *smart dream* of ubiquitous quantitative total availability (Emrich/Roes 2011: 8–9) and the *AI dream*—becomes, in my view, the *smart, ubiquitous AI avatar dream*.

Fox Harrell and Lim characterized the avatar dream in a twofold way: technical and experiential. Computationally created surrogates engage us using text descriptions in games or social media through virtual visual representations in virtual reality environments. The experiential dimension enables virtual surrogate selves to engage in immersive experiences beyond orthodox physical encounters (Fox Harrell/Lim 2017: 52).

In this conception of the avatar dream, people utilize the computer as a chimera-creating tool to hack into their self-image. The avatar dream machine produces surrogates

IMAGE 1.
CLIPPY: IN OFFICE VERSIONS 97 AND 2000, IF A USER TYPED "DEAR" AT THE BEGINNING OF A DOCUMENT, CLIPPY WOULD APPEAR IN THE BOTTOM RIGHT CORNER OF THE SCREEN WITH A TEXT BUBBLE THAT READ, "IT LOOKS LIKE YOU'RE WRITING A LETTER. WOULD YOU LIKE HELP?"

SEE FELDMAN (2016) ON THE DESIGN OF A VIRTUAL ASSISTANT OPTIMIZED FOR FIRST USE OF A FUNCTION THAT WAS THE FORERUNNER OF AI ASSISTANTS SUCH AS ALEXA OR SIRI HTTPS://MONEY.CNN.COM/GALLERIES/2009/TECHNOLOGY/0910/GALLERY.MICROSOFT_WINDOWS_GAFFES/2.HTML

1 This research is financed by Portuguese national funds through FCT – Fundação para a Ciência e a Tecnologia, I.P., within the scope of the Transitional Standard – DL57/2016/CP CT[12343/2018], in the scientific field of History and Philosophy of Science and Technology, Project: *Hacking Humans. Dramaturgies and Technologies of Becoming Other.* Position: 2404.

and transforms each imaginary experiential frame virtually by allowing us to play whoever we want to be. Thus, avatars might become part of a virtual identity. Fox Harrell and Lim (2017: 60) further argue that the avatar dream needs to be reimagined beyond mere techno-phenomenological otherness to take into account society, including biases and stereotypes and constraints to the achievement of social identity as experienced in physical and self-imaginations in virtual worlds. Suppose we do not heed the historical, social, and cultural constraints of human-made artifacts. In that case, we might not avoid system-embedded and user-embedded "box effects"—"the experiences of people that emerge from the failure of classification system (…) stereotypes, social biases, stigmas, discrimination, prejudice, racism, and sexism" (Fox Harrell/Lim 2017: 54)—that would render the avatar dream impossible.

While the avatar dream is specifically related to personal self-image, the *AI avatar dream* goes beyond a mere computational representation of users. Beyond mere mechanical "learning" or "intelligence," the AI avatar dream proposes AI avatars as creative machines (Rauterberg 2021). AI avatar dreams create other AI personas and professional specialists (e.g., therapists or consultants), such as embodied cognitive models, and a dream of another vision of humanity. in which the avatar is even part of a future self-generating art. This AI avatar dream goes in the direction of another artificial, virtual, or synthetic human: a form of self-superation, self-determination, and religious eternal self-salvation, with posthuman capacities, embodiment possibilities, and new modes of an extended human experience. Thus, virtual AI humans

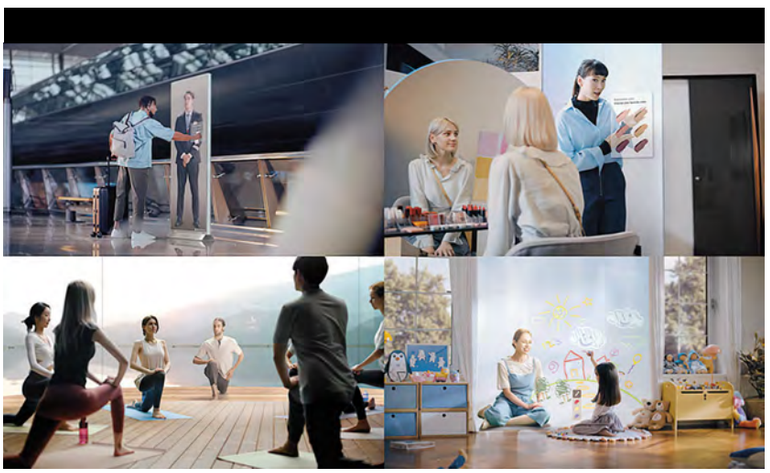


IMAGE 2.
SCREENSHOT AI AVATAR WORKFORCE PRESS RELEASE 2021 WITH "NEON'S VISION OF THE FUTURE OF WORK AND EVERYDAY LIFE" IN FOUR SITUATIONS, CLOCKWISE FROM TOP LEFT: AI AVATAR SERVICE ASSISTANT AT THE AIRPORT, AI AVATAR SALES AND SERVICE ASSISTANT, AI AVATAR TEACHER, AI AVATAR FITNESS TRAINER.
HTTPS://NEON.LIFE/NEWS/CES-2021-PRESS-RELEASE

generate the future media ability to communicate in natural human language, to "learn," "remember," and "own" a personality as well as making decisions by taking actions with their bodies via a set of sensory systems. The idea of virtual humans includes the ability to detect sensations, appraise sensation triggers, and respond to them.

AI avatars act as a digital workforce and function as employees, such as the virtual worker *AMELIA.* AMELIA is a job-based, human-equivalent digital employee that is customizable for each service business, such as for Customer Care, IT, and HR services or multi-lingual digital banking. In the case of the Sterling National Bank, AMELIA—renamed "Skye"—provides human-like communication and collaboration with the bank's contact center agents and in the case of the Netherlands-based IT Service "Centric Burgerzaken" AMELIA is used to provide conversational AI, available 24/7, for digital public services for local government organizations.

AI avatars as algorithmically automatized workers are meant to enhance employee performance culture in VR scenarios within performance analytics. This development

includes companies such as Talespin's co-pilot virtual human training technology or customer assistance and UneeQ's Digital Humans, defined as AI-powered, lifelike virtual beings. UneeQ's Digital Humans are AI avatar workers that mimic human facial expressions, tone of voice, and body language in multimodal embodied forms of communication. These features are more important than mere language-based verbal communication for customer service. The abilities of virtual humans include showing emotion and different moods, making plans, and achieving goals, ideally set by some "internal" motivation. Internal motivation in the sense of Artificial General Intelligence (AGI) could even be an internal avatar model with an external avatar body—with the AGI ability, in addition to reasoning and problem-solving, to mimic the capacity of imagination and creativity. Burden and Savin-Baden (2019: 13) have developed a matrix to analyze virtual humans' traits on different spectra between self-aware and not self-aware, embodied and disembodied, humanoid and non-humanoid, natural-language and command-driven, autonomous and controlled, emotional and unemotional, personality-driven and impersonal, reasoning and unreasoning, learning and "unlearning" (cf. the EmoCOG architecture [Lin et al. 2011] or the OpenCOG architecture [Goertzel et al. 2014] in which attention-related "forgetting" and memory resource management is put forward [Burden/Savin-Baden 2019: 125]), and finally, imaginative and unimaginative. In a posthuman avatar case scenario, such as in Soul Machine's 4th and 5th level of AI avatars, the aims are not only spatial context, as-if imagination, and as-if intentionality, but also creative machine behaviors based on "learned experience" and "agency" for making discoveries and setting new intentions, plans, and goals. Moreover, AI avatars in the future AI dream world gain the ability to train themselves through interaction with humans and non-human systems. Finally, self-awareness and contextual understanding is supposed to emerge in independent digital, artificial persons with a strong semantic or contextual understanding of the AI avatar self's actions to create non-linear storytelling. Nevertheless, AI artifacts that move, speak, reason, and show radical mimetism will inevitably face issues of animism.

2. THE AIS HAVE IT? ON AI AVATARS

2.1 "HIGH FIDELITY" AVATARS: COUNTERFEIT OF HUMAN GAZE OR THE WRONG KIND OF ANTHROPOMORPHISM?

AI artifacts are AI systems that humans create for the purpose of radical mimesis: AI systems mimic actors who grant social faciality to machines in a way that seems human to observers. The AI avatar machine evokes movements of gaze and interest, as well as curiosity, and has to be critically assessed when reflecting on the topic of human or machine creativity. Coeckelbergh (2021) argues for a critical posthumanist point of view towards the anthropomorphism in technical objects that interact with humans. Should we then reject normative anti-anthropomorphism as nonsensical in social robotics and AI avatars? And still: we have to ask how we handle AI avatars not only as extensions of the self but as AI technology for human exploitation and data extraction (Crawford 2021), the cost of which must still be counted in its material, energetic and ecological (cf. Bender et al. 2021) aspects. Some may make a strong stance against AI avatars as simulation machines of not only intelligence but—foremost—human attributes such as creativity, autonomy, affectivity, and for being "artifactors," AI artifact systems that mimic human (like) actors, calling them a "counterfeit" (Pasquale 2020) of humanity. Therefore, the task of clearly separating AI systems from AI actors that mimic humans through anthropomorphic design stances

might seem a good idea for a policy option (Cf. EU 2021) that calls for a renewal of Asimov's Three Laws of Robotics (see Pasquale 2020: 3–19). These new potential rules for AI would go beyond avoiding maleficence by impeding human substitution, human manipulation/counterfeiting, an AI arms race, and non-identification of artificial systems.

2.2 FROM AI CHILD AVATAR TO PLAYING GENERAL ARTIFICIAL INTELLIGENCE WITH A TOY CHILD MODEL: ON SOUL MACHINES'S AUTONOMOUS ARTIFACTOR ANIMATION

The AI research of the company *Soul Machines* "started with a baby", called "Baby X" (Soul Machines 2021). According to IBM *(Soul Machines.* IBM. n.d.) and its Watson assistant integrated into Soul Machines, the aim and business challenges are to build on the paradoxical goal of *empathic AI* that has been staged as evolutionary human progress at the World Economic Forum in 2019 (Mantas 2019). The AI avatar model of Baby X plays interactively with the world around it, pragmatically making discoveries by manipulating things in the way we do. Animation stands at the center of Soul Machines's business, which is inspired by the following questions: "What is the essence of animation? What if a character could autonomously animate itself and you could interact with it? How do you bring a digital character to life?" Baby X interacts with its surroundings by playing as if it were a child that learns, evolves, or "grows" its information base by testing the results of the games it plays; but does it actually rehearse and acquire reality? Soul Machines poses challenges of "problems to solve" that lie at the core of AI avatars as artifactors:

> ***How would we create biologically inspired artificial intelligence? And, build a digital consciousness to create affective computing that interprets and simulates human emotion, engaging autonomously?*** *(Soul Machines 2020)*

Soul Machines's AI avatar initially reminds us of an AI Tamagotchi (virtual pet), referring to the emotional annoyance of having to feed and care for the digital toy in how it is presented. However, the company aims to "make machines and AI as lifelike as possible," envisioning "humanlike AI that has flexible intelligence and a dynamic interface that can relate to people": human-AI relations seem to change in the age of machine learning, having a clear roadmap of how to achieve the highest levels of "autonomous animation."

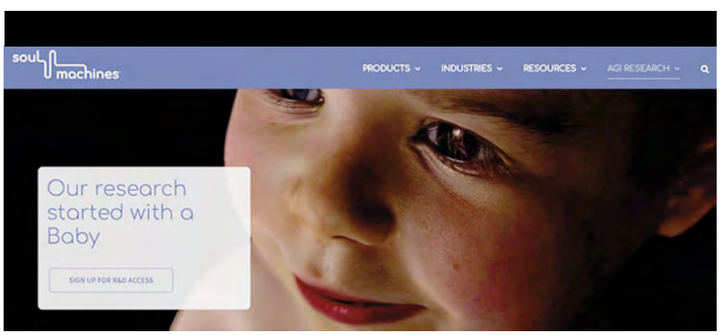


IMAGE 3.
SCREENSHOT OF BABY X ON THE INTERNET PAGE SOUL MACHINES.
HTTPS://WWW.SOULMACHINES.COM/RESOURCES/RESEARCH/BABY-X/

Soul Machines's white paper (2020) distinguishes six stages of autonomous animation, in which level 0 and level 1 are dedicated to actually existent simulated, actor-driven, pre-recorded video or motion capture in which motion-capture cameras function as enabling technology for "possible solutions" in movie and games characters. On this level, avatars are supposed to be used as masks and puppets and heed movement notations of kinetic digital renderings in capturing performance art inside a motion capture imaginary (Karreman 2017) in creative industries, games, films, and contemporary dance. Avatar masks refer to a performer as a puppet master: the avatar mask can be seen as an initial new identity or as a mere puppet in an uncanny zone in between *something*

and *nothing*. For Soul Machines (2020), on Level 1, basic pre-authored animation that is still actor-driven delivers pre-recorded movement based on simple triggers. The corresponding enabling technology would include the FAQ_text-driven conversational database and pre-recorded voice content responses to create *digital puppets*. Levels 2 and 3 of "autonomous animation" would already use Natural Language Processing and "Dynamic Synthesized Human Behaviors" (Soul Machines 2020: 8), a "learning" capacity based as a solution on the Deep Fake level (level 2) or on level 3 with "[f]ull humanlike emotional responsiveness in facial animation including a conversational driven personality," including on the voice level.

With the selling of the idea of the higher-level autonomous AI avatar as part of the AI avatar dream machine industry, we should ask: Does an AI avatar assimilate otherness by radical mimetics to be used in game design and performative conventions for creating *pervasive performances* (Peréz 2016: 16) between acting and engagement? Do AI avatars follow the metaphorical model of Turing's child machine to create and provide "education" (Turing 2004: 460) to an AI child model such as Baby X or are they an AI avatar toy for playing around with artificial general intelligence, such as the AI toy avatar model Kanzi (Negarestani, 2018)?

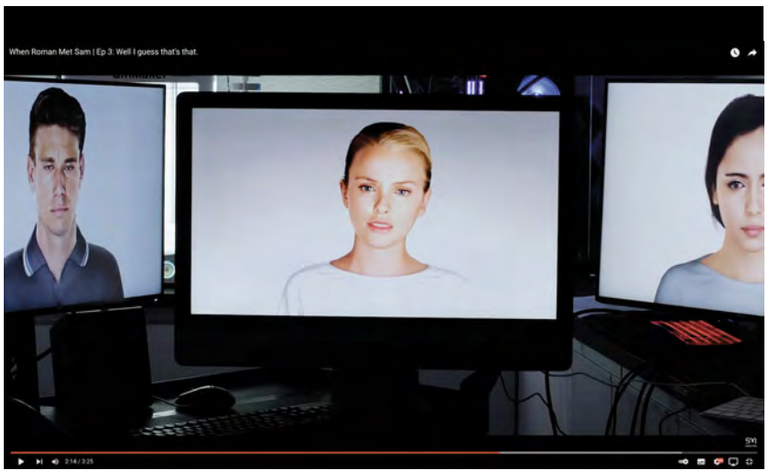


IMAGE 4.
SCREENSHOT OF A TRIALOGUE OF THREE MACHINE COMMUNICATION AVATARS FROM SOUL MACHINES
HTTPS://WWW.YOUTUBE.COM/WATCH?V=4MCDPFKYLTS

2.3 CODEC AVATARS (CA): THE QUEST TO PASS FACEBOOK'S "EGO AND THE MOTHER TEST"

As proximity and face-to-face encounters determine social relationships, the technological roadmap of VR and AR by Facebook's Oculus Rift is heading towards overcoming distance and material barriers, as put forward by Tanaka, Nakanishi and Ishiguro (2014), who had shown that physical robot conferencing was superior to mere avatar chat. By virtual immersion of Codec Avatars, or enhanced Modular Codec Avatars (Chu et al. 2020)—which improve the robustness and expressiveness of traditional Codec Avatars—with holograms and VR/AR, Facebook aims at recreating and mimicking a sense of (artificial) VR telepresence, which provides remote and immersive telecommunication through VR headsets. The training phase of the VR telepresence system in the first stage is done by capturing facial expressions of a user with a multi-view camera dome and a VR headset for face modeling. In the final phase a personalized face animation model is derived using these correspondences, while the real-time photo-realistic avatar is driven from the VR headset cameras. This social teleportation is able to share eye gaze and expressive faciality that would be almost indistinguishable from the real-life presence of a person or object, even enhancing the spectrum of senses using a new artificial digital-media sense that could be called the digital immersive sense of foreshadowing proximity to an object or person.

However, Mark Zuckerberg admits that a) not all material experience while "connecting people" will and can be virtualized and b) algorithmically modeling the materiality of touch and haptics is not easily done. Photorealistic avatar models for "high-fidelity social interaction" of the users' faces render avatars with a "Deep Appearance Model for Face rendering" (Lombardi et al. 2018) "using non-linear, photorealistic full-face models of geometry and texture" (Richard et al. 2020: 1), overcoming the shortcomings of mere

geometric approaches due to the "non-linearities in texture-based tongue motions and lip articulation" (ibid.). The difficulties are related to dark untracked geometry inside the cavities of the mouth that must be emulated with a synthetic texture of the mouth. Facebook came up with the idea that the avatars should not only be acceptable but also that they should not create uncanny valley effects. When setting up an avatar, a second "Turing Test" of social presence for the Facebook Codec Avatar would be if the avatar is acceptable for yourself and "your mother," (Tech@Meta 2019). Thus, Facebook focuses on their codec avatars as an avatar dream of a high-fidelity replica of the gaze. Implicit in Facebook's High Fidelity Avatar (Schwarz et al. 2020: 91) is the concept of high fidelity of Skarbez et al. (2017), who differentiate between a) *physical morphological fidelity of looks* inside the operational environment, b) *functional action fidelity* of faciality of eye gaze or operational performance of the gaze in realistic movements and agency, and c) active *perceptive fidelity*. However, I question if this hyperbolic-realistic "high fidelity" actually encompasses passive perception. What gives the face-to-face encounters a feeling of being together in the same space and experiencing a common "we"? Is the answer to this question related to the idea of *being looked at by an other*, who does not perform exactly as I expect?

IMAGE 5.
SCREENSHOT FACEBOOK CODEC AVATAR DEMONSTRATION VR TRAILERS AND CLIPS, YOUTUBE (JULY 2, 2020) "FACEBOOK'S PROTOTYPE PHOTOREAL AVATARS NOW HAVE REALISTIC EYES"
HTTPS://WWW.YOUTUBE.COM/WATCH?V=ETAMZMYKSG0

2.4 ERGOTIC COMMON-SENSE GESTURE-BASED AI AVATARS: TWENTY BILLION NEURON'S GESTURE SURROGATE AVATAR ASSISTANT MILLIE AND ITS AI APP FITNESS ALLY

The former German/Canadian — and since its 2021 Qualcomm acquisition — US AI company Twenty Billion Neurons (TwentyBN), works on computer vision and AI avatars: It teaches machines to perceive like humans. By developing the avatar "Millie" TwentyBN used a situated visual AI common-sense model via end-to-end learning from short video clips (Twenty Billion Neurons 2020): the "Supermodel." This AI model is a Python-based, deep learning gesture-recognition model based on large-scale crowd-acting operations and has collected millions of short video clips that require no depth information, as the model is entirely trained on 2D video data. This gesture recognition model internalizes a visually simulated "common sense" of the world by identifying a wide range of fundamental human-object interactions and human body motions.

The TwentyBN avatar is based on the AI SuperModel of computer analysis of collected crowd-acting, in which people in the recorded video snippets perform common-sense hand control gestures via different data sets. These include, for example, Jester V1, in which 147 crowd workers performed 27 pre-defined hand gestures in front of a laptop camera or webcam (148,092 short clips of videos with different backgrounds, 3-sec length) and the "20BN-something-something V2 Dataset" inside the probability-guided labels to detect human common-sense actions by AI algorithms of machine vision.

The neural network that offers the data feed to the avatar gesture simulation consists of short videos of mostly ergotic gestures sorted into common-sense pragmatic action classes (caption templates). These action classes are of a general "something [picking, moving, putting…] something" (Goyal et al. 2017: 5848) structure: AI avatars are based on common-sense gesture training sets fed into AI algorithms. These AI vision algorithms use artificial neural nets and deep fake technology. The avatar Millie was introduced in the start-up phase of TwentyBN as an interactive AI avatar in-store shopping assistant, and its corresponding app "Fitness Ally," a virtual avatar fitness trainer, was used to guide the user through a series of workouts and to present them with recorded and interactive training data for fitness improvement.

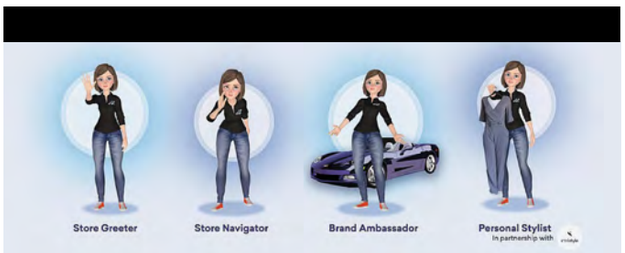


IMAGE 6.

SCREENSHOT TWENTYBN MILLIE'S FUNCTIONAL APPLICATION AS "DIGITAL IN-STORE EXPERT."

SEE: HTTPS://MEDIUM.COM/TWENTYBN/YOUR-DIGITAL-IN-STORE-EXPERT-FOR-EVERYTHING-D0865B82E27A.

THE SLOGAN OF THE COMPANY IS "BREATHING LIFE INTO VIRTUAL BEINGS/ OUR HUMAN-CENTRIC AI TECHNOLOGY BRINGS SEEING AND SOCIABLE DIGITAL ASSISTANTS TO LIFE." THE DATABASE IN 2017 CONSISTED OF MORE THAN 100,000 VIDEOS ACROSS 174 CLASSES; BY 2021 THE DATABASE HAD GROWN MORE THAN TENFOLD.

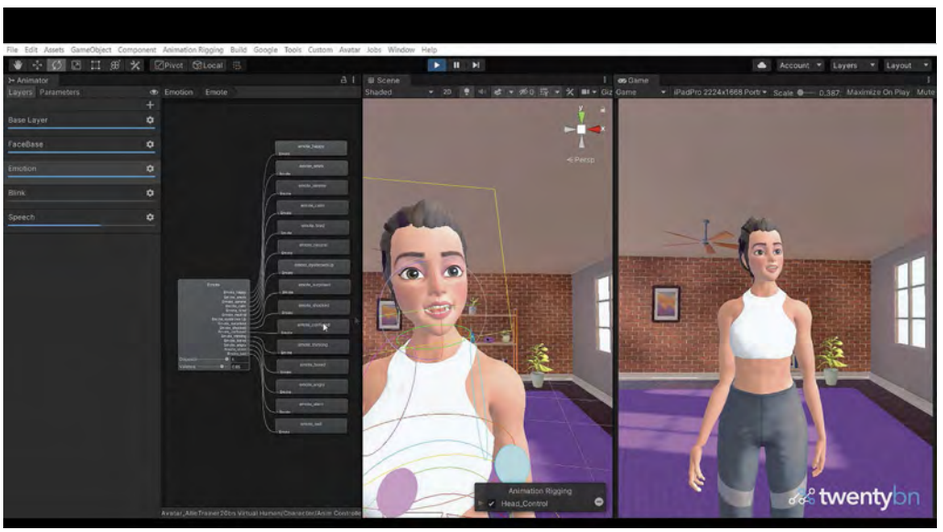
IMAGE 7.

SMARTPHONE APP FITNESS ALLY "REAL-TIME INSTRUCTION AND MOTIVATION."

HTTPS://FITNESSALLYAPP.COM

IMAGE 8.

SCREENSHOT OF THE AI FITNESS TRAINER ANIMATION FACE STACK DESIGN MADE FOR ALLY FITNESS BY FERGUI.



(HTTPS://VIMEO.COM/543742486). (SEE: TBN 2020, DEC 14: HTTPS://MEDIUM.COM/TWENTYBN/PUTTING-THE-SKELETON-BACK-IN-THE-CLOSET-1E57A677C865). TWENTYBN IN 2020 ALSO LAUNCHED PART OF ITS TECHNOLOGY AS AN OPEN-SOURCE PLATFORM, SENSE, "A REAL-TIME ACTION RECOGNITION SYSTEM," OPEN-SOURCE INFERENCE ENGINE FOR NEURAL NETWORK ARCHITECTURES THAT TAKES AN RGB VIDEO STREAM AS INPUT AND TRANSFORMS IT INTO A CORRESPONDING STREAM OF LABELS IN REAL TIME. SENSE INCLUDES DAY-TO-DAY HUMAN ACTIONS (PICKING UP OBJECTS, DRINKING WATER, FIXING YOUR HAIR, ETC.), HAND GESTURES, AND FITNESS EXERCISES, AMONG OTHERS: HTTPS://GITHUB.COM/TWENTYBN/SENSE

Millie was created with Deep Learning training of initially one thousand actions; now the database of common-sense gestures and visual common-sense actions to feed this action recognition pool is far over a million. It contains an object detector, an action/motion detector, a dialogue system, and a rule-engine for recognition and reaction to humans, which is used for Millie and was developed with the following aims (Kahn 2018): a) the immediate aim to build an interactive social sales assistant, gesture control systems for the car industry, and smart home devices b) the TwentyBN long-term aim to build full digital avatars with a designed personality to interact with people in various settings, including full digital social companion, exploring avatars that could even "help" teach children in schools or instruct adults in skills such as yoga or cooking, or an artificial officer such as New Zealand's police artificial person "Ella," developed by Soul Machines.

Whether AI avatars will attain the depth and personality to serve not merely as trainers but actually as pedagogic teachers is an issue that remains an open question.

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II. ACTORS

THE MASK

DIETER MERSCH

Θνατα θνατοϊσι πρέπε

PINDAR, ISTHMIAN 5

Masks, like puppets, effigies, statues, and other artificial figures (fetishes, figurines, totems or idols) are one of the invariants of cultural history. They are found in all cultures, as the faces of animals or of the dead, as representations of hidden forces, meant to honor ancestors or give form to transcendental spirits and gods. Grimacing or serene, colorful, scary, static or almost life-like, in all cases they are a medium of an alterity, of something absent. Whatever is at their core, the mask, as a symbolic figuration, interacts with us as an "other Other."

Their form points obviously to a "faceness" *(Gesichtiges)* (Gombrich 1977). Masks clearly belong to what Gilles Deleuze and Félix Guattari have categorized as the body-head system. (Deleuze, Guattari 1987: 171) They point out that, on the one hand, the head can be separated from the body, yet, on the other, its "facenessness"—to not yet speak of "countenance" *(Gesicht)* or "face" *(Antlitz)*—is the clearest representation of head and body, because it provides their expression. There are of course heads without a countenance, covered countenances *as* faces, even cavities that act *like* countenances, but the fact that we see them as such and attribute feelings to them only serves to further underline the exposed position of the countenance. Accordingly, masks of faces are found in all cultures as witnesses to a meeting with the self, as confrontations with an image of death, as representations of the strangeness of animals, as incorporations of *anima* or *animus,* as evocations of a transcendent or past world, as images of gods or as brushes with what Emmanuel Levinas has called the "enigma of the face" or its "numinousness." (Lévinas 1979: 187ff.)

FIG. 1

ONE OF THE OLDEST STONE MASKS EVER FOUND, EARLY STONE AGE NEAR ISRAEL, CA. 7000 BCE.

(MUSÉE BIBLE ET TERRE SAINTE, PARIS)

The fecundity of the mask as an entity in cultural anthropology has often been remarked upon, as well as the fact that its many facets do not all belong in the same category, and yet they do belong to a common class (Lévi-Strauss 1960). Masks are made of many different materials: feathers, fur, wood, clay, or metal, they are studded with gems and covered in fabric, they are painted and plain, carved from a single piece of wood or assembled from human or animal skull bones, they can also be ornate and adorned with a variety of emblems. There are half-masks that cover only the eyes, and masks attached to costumes that go below the shoulder. There are masks that may only be used once and masks that are passed down from generation to generation, with geographic variations. Finally, there are masks worn only to certain occasions or celebrations, and masks that are ubiquitous. Some display extreme expressions of sorrow or grieving, some are intricately modeled, and others are hollow forms with holes that reference eyes and mouth, as in one of the oldest archeological findings in Israel.

FIG. 2
AFRICAN MASKS
PHOTO: MONIKA ZESSNIK © ETHNOLOGISCHES MUSEUM, STAATLICHE MUSEEN ZU BERLIN – PREUSSISCHER KULTURBESITZ.
SEE HTTPS://ARTINWORDS.DE/AFRIKANISCHE-KUNST/

FIG. 3
AZTEC MASK OF THE SUN GOD TONATIUH, LONDON.
SOURCE: AP
HTTPS://WWW.WELT.DE/KULTUR/ARTICLE4591746/ALS-MONTEZUMA-SEINE-KUENFTIGE-BRAUT-HAEUTETE.HTML

The symbolic meanings of masks are just as heterogeneous, as is their function within and outside of rituals and in practices of performative abreaction of trauma and other catastrophes. They act as mediators between the beyond and here, between the 'immortals' and mortal humans, an echo of the past or the liminal space between presence and absence. But everywhere they stand for the intrusion of a strange force that must be placated; they push the boundaries of tradition, they question the present or negate the community while celebrating its allegorical destruction, its transgression and resurrection. As intruders from or heralds of another world, they spark a metamorphosis. They make a break in cultural life through the transformation that begins at their arrival. They renew connections that had become fragile or confirm contracts and political relationships. At the same time, they aid passages: the shamanic journey or the crossing into a new state such as initiation or death. They provide us with alien powers and cannot be controlled by us, instead they displace us to a "third" space beyond the facts of our birth, individuality, and social status.

FIG. 4
ANTIQUE THEATER MASKS
HTTPS://WWW.PINTEREST.DE/PIN/341358846746049638/

For these reasons, Roger Callois has insisted that "masks are the true social bond," because they act not only as magical objects which attract other powers to themselves, they also take possession of the community to bring it together, renew it, or protect it from evil influences (Caillois 2001: 89). Yet at the same time masks reveal the fragility of social existence; they summon the finitude of human life, the loneliness of death, and the insoluble historical disruptions of the *conditio humana*. Hence the mask refers not only to the "bond" *(religio)*, but also to its dissolution and disintegration. It's duplicity is thus three-fold: in view of our selves, of the Others and of the community as a whole. Hence the mask becomes a focal point; both the site of the true κοινωνία *(koinonia)* as well as of the questioning thereof.

It is the appearance of an exception that has no place within the community, but nevertheless both generates and problematizes community and its forms of "participation." Excluded, it includes the possibility of community and a break with the same.

As an artificial alterity, the mask evinces the ambiguity of the experience of the Other, of our dependency on others and their unbearableness. For communities are in no way simply there; they are permanently traversed by the rift of alterity which both allows them to be and divides them in equal measure. The mask embodies this conflict: the necessity and unavailability of the Other, their interruptions and resistance, their negation and foreignness and concurrently our unease regarding κοινωνία and its never-fulfilled promise. The mask is then the medium of an escape, a way of fleeing from the constraints of community while also practicing the "other gaze" that allows us to see ourselves with distanced eyes. It creates a caesura, and holds up the mirror of alterity, with all of the word's connotations, because the "truth" of the social state is the riddle of alterity as that which is always in the way and undefinable, that cannot be coopted or controlled by naming. Consequently, the mask denotes both the shiver of difference and at the same time the fascination for that *enigma* that religious studies scholar Rudolf Otto has linked to the "holy." (Otto 2004) And in confrontation with the enigma, one is equally confronted with the ungraspable foundation, with the question why "the *Seiende,* that which is, is, rather than is not." (Heidegger 1984: 2, 12; 1972: 53f.; 1965: 21)

DUPLICATION

All of the above helps to account for the extraordinary metaphysical depth of the mask, its quasi-philosophical "secret." And yet it has not yet been fully defined. Hidden, it remains the unknown per se, holding an infinite diversity of cultural possibilities. Just as humans, according to Nietzsche, are "the still undetermined animals," so do masks, as their desires, self-portrayals, transformations and divine foundation, remain indeterminable (Nietzsche 2002: 56). No definition can capture it; the mask always proves to be more than it shows or purports to represent, more than it can symbolize, because of its many functions and practices, even more than it promises to resolve through ritual performances. For this reason, it is more than just a *medium,* which it of course also is, because it breaks through the mediation, transverses its metamorphoses and realizes its potential in a never-ending round of transformations. As Claude Lévi-Strauss clarified in his study of masks:

> ***It would be misleading to imagine …that a mask and more generally a sculpture or a painting may be interpreted each for itself according to what it represents or to the aesthetic or ritual use for which it is destined. … On the contrary, A mask does not exist in isolation; it supposes other real or potential masks always by its side.*** *(Lévi-Strauss 1982: 144)*

This means that masks are constantly "becoming." Yet there is more, for we are looking not only at relationships of inclusion and exclusion and their movement, but at a network of artifacts, their history, and their futurity. Thus when Caillois calls the mask "the true social bond," that is not the whole of the matter, whether we are looking at processes of identity creation, communication, the localization of social roles or the attestation of sovereignty, because experiences of destruction, death and renewal are equally important. From the beginning, the mask is therefore situated in an "other" place, a beyond, an *u-topos,* that evades every attempt at determination. Masks therefore touch simultaneously upon the possibility and the impossibility of the social bond, upon our mortality and our immortality, and upon the legitimacy and illegitimacy of our identity. In the end, they tear down the difference between being and appearance or between truth and falsehood, and always have a share in the chronic precarity of cultural meaning.

Where then does their infinite perpetuation come from, their evolution and the desire for the replication of forms, the desire to create further "figures" and "faces" besides ourselves, ambiguous creatures on the line between the oppositions that constitute sociality and consciousness, as if it were important to continually shift and unsettle that border and create doubt? Do they satisfy our wish to ourselves be creators, to constantly duplicate ourselves between veiling and exposition, between disguising and discovering? Is the mask above all an ἄγγελος, an *angelos,* a messenger of the paradoxicality that swings from passivity to activity, between the given actuality *(Ge-gebenheit)* of the world and the contingency of the social bond, always threatened by collapse?[1] Does it herald the primary unrealizability of community and its culture, raising its demonic head wherever it is accomplished, mocking its hopes and economies? Then perhaps the dynamic creation of multitudes of artificial Others—the boundless multiplication of not only masks but also sculptures, dolls, marionettes, and images and maybe also todays animated figures, including robots and artificial intelligence—is a panicked sublimation of our mortality and an attempt to liberate ourselves from it, to banish the death wish and in so doing separate ourselves from the Other and the intrusion of the autonomy and corporeality of others. Don't all of these figures have something of a corpse in them, insofar as, as Slavoj Žižek provocatively stated, "the only good neighbor is a dead neighbor," since only the dead body and ossified face is under our control and at our bidding, reconciling us with its otherness (Žižek 2005).

In that case, ownership, displacement, and power are the strongest drives behind our desire to create artificial Others that we can burden with all of the ambivalence, hate, and guilty conscience that resides within the social bond and its gaping wound. Consequently, masks transpose the negativity of affect by transforming the dialectics of social dependency and resistance into a second, abstract "face" that haunts us equally with its threat and with its laughter, putting fear into us. If so, we must also admit that the mask cannot be an object of libidinous desire, for it is neither loved nor rejected, neither recognized nor despised. Rather it transfers our feelings by, standing in for the real Other, acting as a foreigner or an intruder, submitting itself to a delusion that is in equal parts destructive and power-hungry. Put another way, this means that we need duplication in order to again and again find our way in the labyrinth of our own incomprehensibility as well as the unworkability *(desœuvrement)* of the social bond, In short, the fragile nature of our existence Nancy 2010; 1990; 1991).

DUPLICATE AND DOPPELGÄNGER

To counter this fragility, the mask is linked to the simultaneity of covering and discovering, of veil and revelation, to the extent that that which is hidden is displayed all the more. But this dialectic is given only when the masquerade is interpreted symbolically and as part of the order of representation. Yet the play of opposites has more depth and more branches, it is more ambiguous and complicated than it seems at first glance. For the mask does not cover one face only to offer us another with which we can present ourselves on the social stage. It also does not denote the travesty of the face *(Antlitz)* under which our true countenance is revealed. Rather it exposes the concealment and then masks the exposure and vice versa, disguisung while at the same time uncovering the covering, so that we are always dealing with a play of double negatives.

This negation should not however be confused with a contradiction in discourse, for it is an iconic "obliterative" negative. Obliterative discourse always obscures an Other that is not questioned in its presence but remains chronically undefined. It is a practice of negation that connects to a practice of deletion, disguise, highlighting, and striking—not for nothing did the mask as πρόσωπον *(prosopon),* the tragic actor's cloak, and ὀθορνος *(cothurnus)* belong

1 Weihe (2004) also views the mask as a contradictory form, albeit from the perspective of systems theory.

together in Ancient Greek theatre—that, following Sacha Sosno and Emmanuel Levinas, can be called "obliteration." (Lévinas 2019) The mask is the epitome of such obliteration; as a superficial, hollowed form it erases its wearer and simultaneously makes them into something incomprehensible that, through a collection of holes in place of the eyes, mouth and nose, speaks of bodily orifices and insinuates an unknown interior. It follows that it is not the mask itself that is mysterious, but the way in which it is used, which produces a secret by presenting something visible that at the same moment flips into something invisible, touching upon the mystery of life itself. Made of cavities and openings, the mask hints at a space behind it, a dimension of an Other kind, that is similar to that which we discover in all life and in every creature that shares with us an indelible bond of elementary relationship.

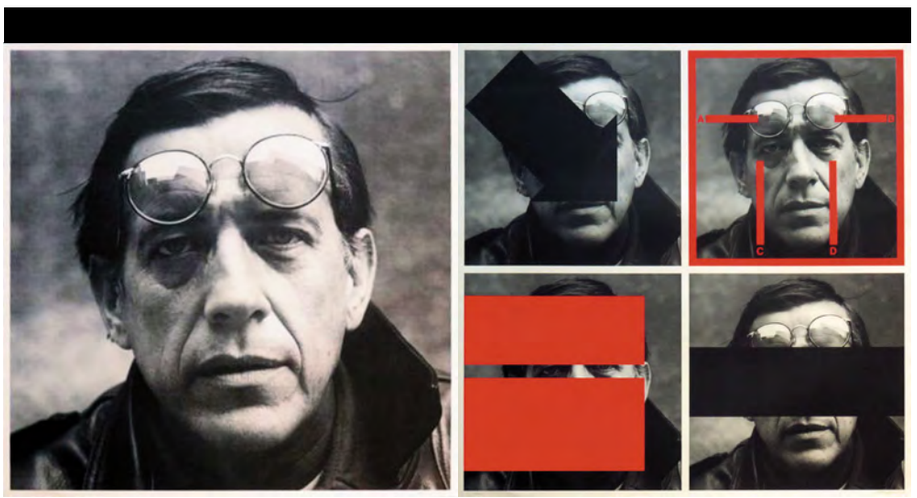

FIG. 5
SACHA SOSNO, *AUTOPORTRAIT* 1997, GRAPHIC PRINT, SILKSCREEN.
SEE HTTPS://WWW.PICASSOMIO.COM/SACHA-SOSNO/43559.HTML

This links the mask—in contrast to machines and their mathematical simulations such as avatars, which are nothing more than black boxes—with another deeply-rooted cultural figure, the doppelgänger. The doppelgänger, too, confronts us with the instability of our identity and hence also with the countenance as an expression of supposed authenticity and as the form of its attributes. The duplicate separates us from ourselves, it is both the same and foreign; at the center of the face is creates a rift, a difference. The mask has the same effect, except that it puts one countenance upon the other, dispelling its certainty and allowing a glimpse of an infinite space "behind" it, just as the doppelgänger transforms the unequivocalness of identity into a ghost.

FIG. 6
GIORGIO DE CHIRICO. *THE TWO MASKS,* 1926

Over the course of the Middle Ages, the phantasm of the doppelgänger became a spectral object that not only portends something beyond appearances that lasts after death, but more importantly suggests that we—simultaneously "divine" and "bestial" or "dividual" and "individual"—can not be one with ourselves. For if we believe that life is saturated with a transcendence and a divine "gift," then, just as the individual means the ἰδιώτης, the *idiotis* who does not have a part of the whole and shuts himself out of the community, an insoluble contradiction is constitutive for our existence. Woven into a world of superstition, deception, and confusion, doppelgängers appear as messengers of fate, as a sign of or in anticipation of future events that tear open the gap, the rift, and make the contradiction manifest.

The mask is cut from the same cloth, like the mask, the doppelgänger obeys the genuine duplicity of συμβάλλειν, *symbállein,* to throw together, and διαβάλλειν, *diaballein,* to throw apart, or of connecting and separating, as well as of the circle of life caught between order and chaos. That is why its appearance makes us uneasy. The mask can therefore be seen as a preeminent object of ambivalence, as a magical point, at which the phenomenon of the doppelgänger also crystallizes, which is why Hans Belting (2017: 32ff.) situates its origin in the death cult, in the effigy as the simultaneity of decay and preservation. The frozen expression, the

petrification of its features receives a second covering as a momento, so that the mask becomes a continuation and an outliving, confronting the ἐφήμερος *(ephemeros).* We are, as Pindar wrote, "creatures of a day," doomed to die and σκιᾶς ὄναρ ἄνθρωπος *(skias onar anthropos),* only the "dream of a shadow" that needs to give form to memory to transcend its own painful dissolution.[2]

Seen in this way, the mask also promises continuity of the dead in life, their resituation at the site of the duplicate *persona,* caught in constant transformation and participating in both kingdoms: the living, social world and the *persona* as the actual image of the dead person. While this primary meaning as a statuary sign of those whose "faces had been lost" is mostly temporal, a second, derivative meaning is suggested that must be understood spatially, namely the presentation of an absent power (Belting 2017: 34). The mask thus becomes a figure of power, an emblem of the presence of the absent ruler, while also belonging to the order of ephemerality and its concurrent precarity. For just as human fragility demands permanent symbolic restitution for more than a day, so does power. Hence a symbol of power is inscribed in the mask that reconstitutes political power at the site of its *absentia*. Its appearance is then like a memorial that has no *real* power, but all the more *imaginary* power, whereby the imaginary is more powerful than the manifest, for it has already internalized power as an idea.

THE PUBLIC COUNTENANCE AND THE *ABSENTIA* OF THE FACE

In both cases, however, the mask is linked to duplication and so associated with the figure of repetition, of which images of death and power are merely the two most distant poles. Belting also reminds us that face and mask intersect, and that we pay great attention to shaping our social faces as the surface of expression and proof of our personality. For that reason, Gilles Deleuze and Felix Guattari have suspended all representational logic and melded mask and face: "The mask does not hide the face, it is the face. … everything that is public is so by virtue of the face." (Deleuze and Guattari 1987: 115) That means we must read the expressive face not only—as in physiognomy—as a "signifying system," but also attribute theatrical passion to it through the pose that is part of theater's exquisite repertoire. Theater also becomes an exemplary medium for the description of sociality (ibid.). Masks, whether of the everyday or the sublime, are always theatrical, just as in theater the face is subject to the tireless economies of adaptation, where it throws itself into the public eye and tries to draw all eyes to itself.

Rainer Maria Rilke drew a caricature of their sometimes dismal efforts in his novel, *The Notebooks of Malte Laurids Brigge:*

> *There are many people, but even more faces, since everyone has several. There are people who wear a face for years, and of course it wears away, gets dirty, wears in the creases, stretching like gloves … Those are thrifty, simple people, they don't change their face, they don't even have it cleaned. … Other people change their faces over uncannily quickly, and wear them out. At first they think they have enough of them to last them forever, but hardly have they reached forty, they're on the last one. … They aren't used to looking after faces; their last wears through in a week, has holes in it, and in many places it's as thin as paper; and then gradually the base layer starts to show through, the non-face, and they go around wearing that.*
> *(Rilke 2016: 4–5)*

2 Pindar: "Creatures of a day. What is someone? What is no one? Man is the dream of a shadow." (Pythian 8: 95). See Fränkel (1946): 132–133. Ἐφήμερος, in early Greek literature, does not mean "creature of one day, short-lived" but "subject to the (changing) day, variable," and the term implied that along with the shifts and changes of a man's life, his outlook and character fluctuate; thus man is unsubstantial and a mere "shadow in a dream."

The public face wears out, but there is no final ground "behind" it, no authentic face to counter the faces that are put on, as is said of the death mask. Instead, there can be nothing under the mask but more masks.

That is why there are only masks and no faces, as the mask behind the mask behind the mask behind the mask behind the mask etc. exposes an abyss and finally ends at the cast of the dead person, whose expression is as distorted as the first mask. We are confronted with the concept of 'nothing' as found in Jacques Derrida, for example in the inconspicuous "a" in *différance,* assuming the mask does not signify something extant but only itself and its never-ending proliferation. (Derrida 1982) Masks are not pulled over the face in order to hide it, rather they reproduce the face as a supplement. Yet the question remains whether the chain of supplements exposes a trace of that which does not allow itself to be masked. For Deleuze, the answer is clear:

FIG. 7
TONI SAULNIER (1926–1968) *A PARIS, RUE JACOB, LE DÎNER DES COLLECTIONNEURS DE TÊTES,* 1966
PHOTOMECHANICAL REPRODUCTION FROM "L'ART NÈGRE" *PARIS MATCH,* 21 MAY 1966

> ***Repetition is truly that which disguises itself in constituting itself, that which constitutes itself only by disguising itself. It is not underneath the mask, but is formed from one mask to another as though from one distinctive point to another, from one privileged instant to another with and within the variations. The masks do not hide anything except other masks.*** *(Deleuze 2001: 17)*

This however implies that all masks are related and only function when they are constantly repeated, shifted, and transformed, and also, as Deleuze continues, that repetition can only be "that which disguises itself." Correspondingly—expanding on Nietzsche's ideas in "On Truth and Lies in a Non-moral Sense"— the differentiation between truth and falsehood or between authenticity and fraud is obsolete (Nietzsche1993). Nothing can be repeated before the repetition that it refers to or that could be referenced from it, because "the mask is the true subject of repetition." (Deleuze 2001: 17) Having said that, the key difference is not between genuineness *(Eigentlichkeit)* and masquerade, but between mask/countenance on the one hand and 'face', in Levinas's sense, on the other, for the "face" is not the true countenance, but the invisibility of alterity *in* the countenance—that moment that makes a face human and forces a truly ethical turn. We *see* countenances and observe them, identify expressions, mood, and mimicry, but we *meet* faces, albeit only when we allow ourselves to be touched by them, so that the mode of experience is not αίσθησις, *aísthēsis,* but response and responsibility.

The distinction that thus comes to light is homologous to the differentiation between the two types of relating, namely through identification and so through perception and interpretation, including the origin in naming and the circulation of the sign, and on the other hand through passivity in the form of accepting and acknowledging, within which is always immanent both the fear and the respect for that which we are *not.* Beneath the mask is no αύθεντης *(authentēs)* that must be discovered, but the "trace" of the *alter,* both behind the masks of others and in our own mask-likeness. Put another way, there is a categorical difference between the mask and alterity that is subsumed neither in the differentiation between truth and falsehood nor in that between authenticity and pretense, but which oscillates between identity and non-identity, for alterity is neither true nor false, just as the mask can not be primary or derivative.

SIMILARITY AND DISSIMILARITY

Importantly, masks are not iconic; they are not primarily images, but plastic objects whose most conspicuous characteristic is perhaps their negativity in the form of those cavities that we have delineated as obliterative. They not only gape open in lieu of eyes and mouth—the places through which voice and gaze and thus the "trace of the Other" escape—but they also form cavities that allow us to animate them with magical possession. Even if every mask does not necessarily need a wearer, still they are not moved by αυτόματον *(automaton),* but by something that, while ecstatic, communicates with us and appears to share with us of the same mystery. For that reason, all masks incorporate something Other into themselves, indicating the relationship of all creatures, the inability to grasp existence, and the power of drives that resist control, as well as the unruly longing of life and its unavoidable relationship to death.

FIG. 8
EMIL NOLDE, *MASKEN II,* 1920, OIL PAINT ON CANVAS, 74 x 88,8 CM.

That means, however, in complete opposition to technical artifacts, whose vectors aim at hypermimesis and consequently at a similarity that is almost sameness, for the mask, it is dissimilarity that is important. It is ἀνόμοιος *(anómoios),* for if one compares mask and face, the former is like a distortion or grimace of the latter, in which a faceness begins to appear and is rejected in the same breath. That which is dissimilar is however constitutive for every similarity, and not the other way around, its difference also makes reflexive access possible. Mathematical models in contrast aim at the technological simulation of identity: their τέλος *(telos)* is homomorphism, whose main principle is structural sameness. They aim at mimicry, at being deceptively real, the perfect imitation. Here we see one of the characteristic misunderstandings of a technological era that has more than its share of misunderstandings, for its proliferation of artificial figures stems from a misguided supposition about people and their *humanum,* which has no use for copies or for the radiance of illusionism, but always only for what is heterogeneous and finite, and for the resulting self-restraint. This does not, finally, denote a lack, but *potentia,* for only "mortal aims befit mortals."

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CREATING MY DIGITAL SELF

STELLA SPEZIALI

INTRODUCTION

In 2019, in the context of building up the *Immersive Arts Space,* an art/tech lab at the Zurich University of the Arts, I was asked to investigate how to create a digital twin from a real, existing person. It was about essential questions like, figuring out how to scan him or her with different techniques or clean up the data, handle the rigging, and master the animation. The goal was to create a digital twin of that person as a final output. I decided to boldly take on the challenge, not knowing at the time the steep learning curve I would be on. I am not afraid to experiment with things I am not familiar with. I am also in constant pursuit of the latest technical innovations to understand and deepen my skills. Back then, I only had basic understandings of how to build a hyper-realistic digital human. Nevertheless, having myself available at all times as material to work with, I decided to create my digital twin.

Needless to mention that making a digital human is not a simple task. A series of carefully calculated steps needs to be executed. Otherwise, you may find yourself redoing and correcting the same steps several times. Each one, no matter how small, will affect the final result. So, before I started creating my twin, I made a list of criteria that I wanted to follow:

- The objective was to create a coherent self-presentation as close to identical with one's physical self as possible, in order to achieve a realistic, aesthetically looking digital human.
- An important aspect was to use a combination of low and high-tech solutions and equipment, so as to keep a lid on costs.
- The outcome was planned to be animated in real-time by motion capture technology and integrated into virtual environments.

Given the continuous technological progress in creating virtual humans, an essential general focus is photo-realism (Bartl et al. 2021). At the same time, there is still an ongoing debate about whether realistic-looking virtual humans are prone to facilitate the *uncanny valley effect,* which describes the phenomenon that close-to-real looking artificial humans may strike us as eerie (Mori et al. 2012). The manifold approaches for realistic 3D-reconstruction vary mainly in their technical complexity and the resulting costs involved. These two factors

influence the degree of realism that can be achieved. So far, expensive multi-camera rigs, based on high-quality image sensors — as used as in professional light stages — achieve the best quality. However, alternate approaches, based on more affordable consumer hardware, for instance, single 2D photo cameras or smartphones, are becoming more elaborate and thus more popular. Most of these low-cost approaches share the vision to make the inexpensive production of digital alter egos possible for everyone without a complex hardware setup (Bartl et al. 2021).

Together with my fellow researchers, Florian Bruggisser, Patxi Aguirre and Tobias Baumann, we focused on consumer-level hardware and invested much time in simplifying the complexity of the processes. We also had the opportunity to be mentored by an expert in the industry.[1]

CREATING MY TWIN

I used a combination of low-cost solutions, such as using a single DSLR camera to capture multiple views of my face and body. I also applied a more complex and expensive handheld device to produce detailed scans of facial expressions and body parts such as teeth and hands. The first method uses a photogrammetric reconstruction [Fig. 1] and provides a rather rough 3D reconstruction of my face and body that needs further processing and optimisation. The advantage, however, is that it produces a basic surface texture that can be used for the 3D model later on.

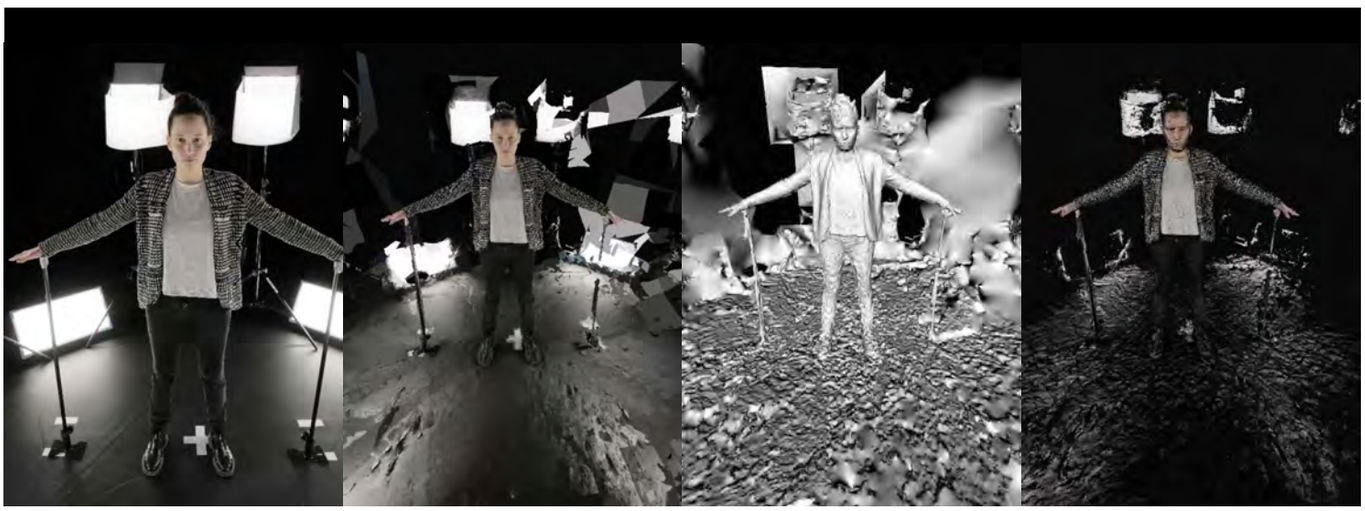

FIG. 1

PHOTOGRAMMETRY PROCESS WITH THE SOFTWARE *REALITY CAPTURE*. ORIGINAL PHOTO, POINT CLOUD RECONSTRUCTION, 3D RECONSTRUCTION WITHOUT TEXTURE, 3D RECONSTRUCTION WITH TEXTURE.

The second method leads to precise and very detailed reconstructions. In fact, for the facial expressions and hands, I used an EinScan Pro, which employs a modular structure light projection (it generates a striped pattern) that produces the 3D reconstruction of the scanned surface [Fig. 2]. With its much faster processing, this scanning device can provide a series of distinctly different facial expressions [Fig. 3] in a relatively short period. It also manages to capture wrinkles and other morphological details of the skin [Fig. 4].

For scanning my teeth, I asked my dentist to make me an intraoral scan, and he used the 3Shape TRIOS scanner to generate the 3D reconstruction. Both methods, in combination, generate high-quality virtual humans ready to be processed, animated, and rendered by standard Extended Reality (XR) simulations and game engines such as Unreal or Unity.

1 Matthias Wittmann, who is a member of the Digital Human research group at Digital Domain, reviewed our progress and advised on how to master complex processes.

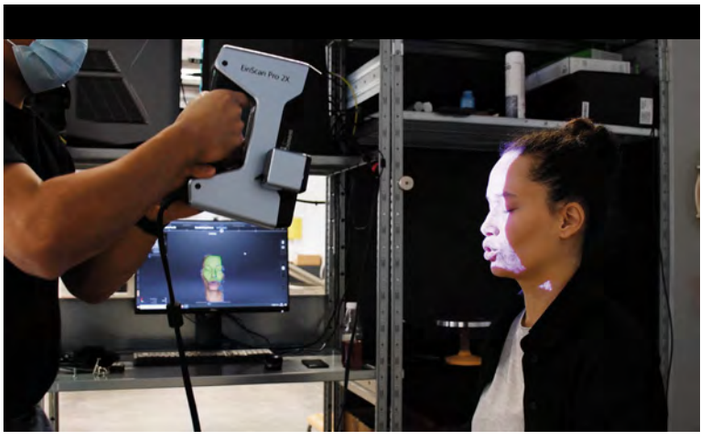

FIG. 2
HANDHELD SCANNING.

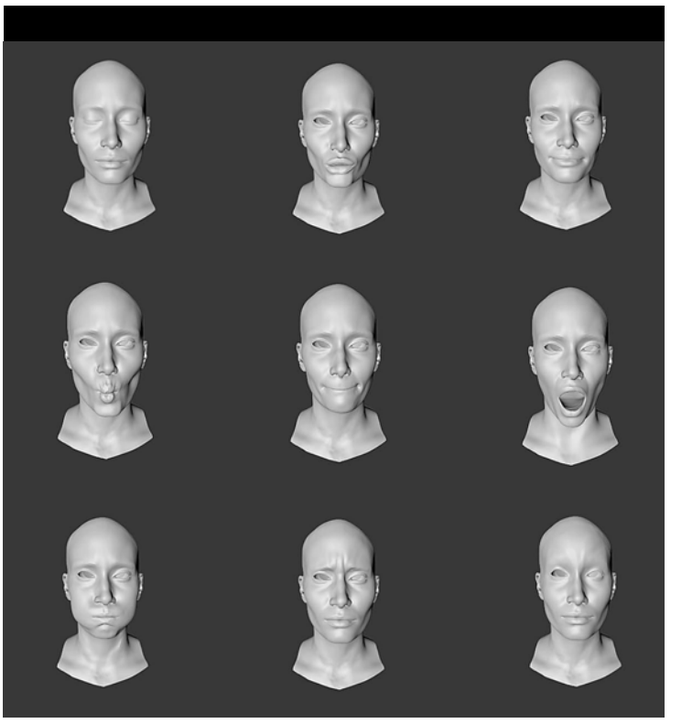

FIG. 3
SCANNING RESULTS OF MULTIPLE EXPRESSIONS AFTER CLEAN-UP.

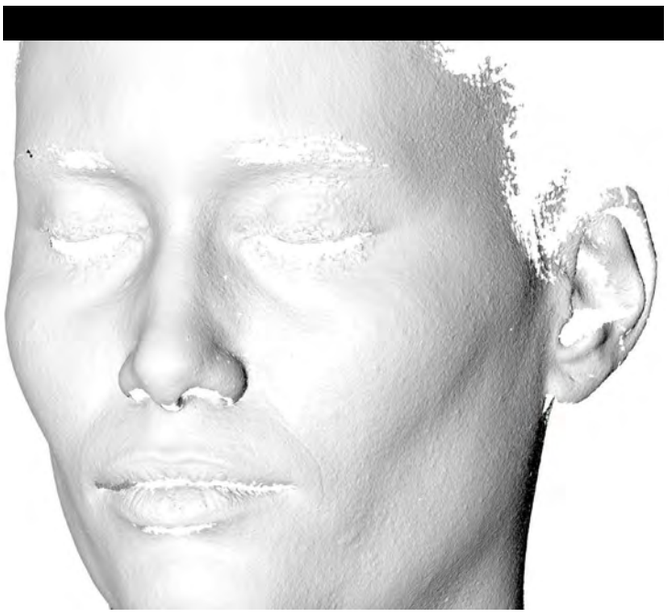

FIG. 4
MORPHOLOGICAL DETAILS OF THE SKIN.

With each iterative 3D model of myself, we compared the result in an immersive virtual environment. For this, we imported the reconstructed 3D model into the digital universe of a game engine and compared the appearance of my authentic self with the digitally reconstructed copy. My virtual variants are perceived consistent in terms of similarity to the original, human-likeness and uncanniness, even though we perceived them differently in terms of realism. As I have a more intimate awareness of my body than my colleagues, I have the impression that my virtual body is less realistic than my fellow researchers think it is. Strangely, I perceive it as plastic and synthetic. Consequently, with each additional version of my digital twin, I feel pressure to create an increasingly perfect version of how I look in real life [Fig. 5, Fig. 6].

GETTING TO KNOW MY TWIN

Once the digital twin exists and is manipulable, a new set of questions arises. How do I perceive and approach my digital self-presentation? Furthermore, will this new self-presentation affect my self-conception?

Motion capture technology offers the full-body tracking of my movements and the transfer of these movements to the digital twin. This enables consistency between one's physical body and the digital double. An additional and similar transfer can take place regarding facial expressions by means of performance capture. The importance of exact correspondence of bodily and facial movements is essential for constructing and experiencing a self-representation. The body itself becomes the immediate and sole instrument to control the digital twin and thus provides an intimate connection between one's physical body and one's digital self (Freeman/Maloney 2021).

FIG. 5

DIGITAL TWIN 1.0

MADE IN COLLABORATION WITH MY COLLEAGUES.

FIG. 6

SIDE BY SIDE COMPARISON OF ME AND MY DIGITAL TWIN 2.0

MADE IN COLLABORATION WITH MY COLLEAGUES AT THE IMMERSIVE ARTS SPACE, ZURICH UNIVERSITY OF THE ARTS.

The perceived realism of virtual humans depends just as much on their movements and behaviour as it does on their photo-realistic appearance. Until now, this project focused on appearance rather than behavioural realism. Nevertheless, this does not exclude a further investigation once the digital twin is completed and usable in interactive real-time situations.

Since the digital body can be fairly manipulated and customised, this can raise questions regarding identity, race and gender. By doing this, I have the opportunity to deviate entirely from my real-world identity, projecting myself in a way that looks nothing

FIG. 7
AVATAR MADE BY ME WITH READY PLAYER ME.

FIG. 8
AVATAR MADE BY ME WITH FACE HERO.

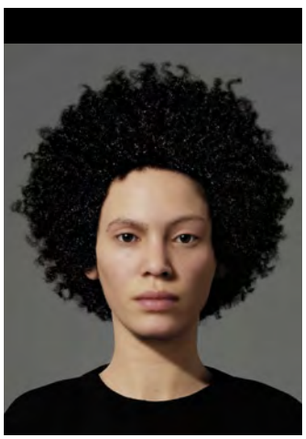

FIG. 9
METAHUMAN MADE BY ME WITH UNREAL ENGINE METAHUMAN CREATOR.

like I do in real life. Digital spaces afford the experimentation and projection of entirely new identities, but what does this mean for me as a human being? What does it mean for others that know me, but interact with my digital twin? The types of relationships we have with digital representations of ourselves can vary widely. Moreover, since the way we represent ourselves is often nuanced and complicated, it does not stay static. (Fisher, 2021a). Some people choose to create a fictional character and have an avatar that looks nothing like they do. Others will make an idealised version of themselves, whereas others like me will try and make the most true-to-life version they can (Fisher 2021b).

SHIFTING IDENTITIES AND GENDER EXPRESSIONS

I have also tried to recreate myself on different platforms, from the stylised versions [Fig. 7, Fig. 8] to a hyper-realistic version [Fig. 9].

A stylised avatar offers some level of abstraction and idealisation as well as different levels of body ownership and periodically shifting appearances. At the same time, it also enables one to "experience different forms of embodiment—including human, nonhuman and perhaps somewhere in-between" (Virtualis 2020). The sense of authenticity and the multiplicity of digital identities surface when the avatar is given a personality, unique behaviour, intentions and style. When we create avatars, we never truly and completely capture ourselves. However, nuanced presentations emerge as intertwining relationships among different dimensions of identity emerge, such as appearance, gender (female, male, binary and non-normative), race, ethnicity and age (Freeman and Maloney 2021).

Yet, there are no precise rules on how we choose to portray ourselves in the digital world. The main constraints are given by the platforms, the knowledge and capacity we have, and of course, by a great deal of resilience and motivation to experiment with those intangible differences between one's physical self and the digital counterpart.

When it comes to using virtual humans and avatars, the *Proteus effect* is a prominent research topic. It describes the phenomenon that the avatar appearance can influence users' attitudes and behaviour based on stereotypical beliefs (Bartl et al. 2021). Indeed, selective self-presentation and performance occur in people's behaviour, perception and cognition, since they conform to their avatar and the mental stereotypical characteristics and personality the avatar represent. This representation of self may be a different social identity, one without the limitations of the physical world, which leads to a seemingly unrestricted expression of self (Freeman and Maloney 2021).

SEEING MY TWIN DAMAGED AND DEFORMED

Looking at all the different avatars I have created, I believe my hyper-realistic digital twin represents me the most accurately. This is probably because of the amount of work I have dedicated to it, including all those frustrating moments in the creation process when I finally realised that other techniques would work better than the one I chose previously, including those instants of embarrassing hilarity when you see your digital twin being awkwardly deformed.

This is likely to happen during the animation process, particularly when my digital twin gets moved and animated by male colleagues trying to solve technical issues. In that

process, mistakes can happen, and then I find myself seeing my digital twin completely distorted [Fig. 10], maybe also with the wrong face texture [Fig. 11], almost like a monster. However, the fascinating thing is that there is an adequate distance between her and me, mainly on the empathic level. Even if I perceive a particular violence in the facial deformation or skin aesthetics, this violence is not perceived as directed to me, but aimed at some other entity. It may be due to my experience of playing characters in realistic games, where I have the feeling that the 3D model of myself is empty, is dissimilar enough from me, from my human person, to remove almost entirely that uncomfortable connotation that accompanies the damaged digital body. Yet strangely enough, there is still a lingering feeling of unease created by the mingling of humour with violence.

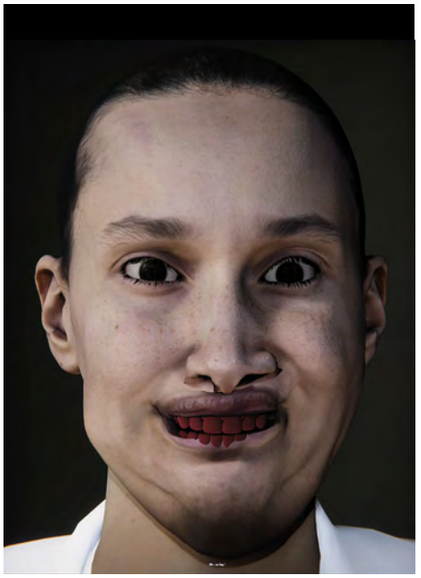

FIG. 10
DIGITAL TWIN WITH DISTORTED FACE.

CONCLUSION

I am intrigued by the possibility of experiencing my everyday self in a novel way and exploring undiscovered potential. Then again, having concretely experienced my highly realistic digital twin makes me more sensitive about my identity. I am actually a little sick of always seeing my face and body in digital form. Yet it has encouraged me to immerse myself in the idea of a different body, inhabiting unfamiliar gender and ethnic spaces.

By continuing this research, I would like to investigate diverse new practices, phenomena, and interaction consequences surrounding the self-presentation mechanisms in virtual environments. I believe it is increasingly important to understand how people represent themselves digitally and how virtual environments might influence their behaviours, especially by outlining the potential benefits and opportunities in terms of awareness of identity and gender matters. This might include raising questions about and proposing limits to the appropriation and exploitation of digital human beings. Furthermore, and perhaps in a more generalised way, I strive to create some sort of guideline to help people grow aware of digital humans and learn to discern them from real people, maybe while helping them develop some critical thinking when they come across digital humans in socio-technical systems.

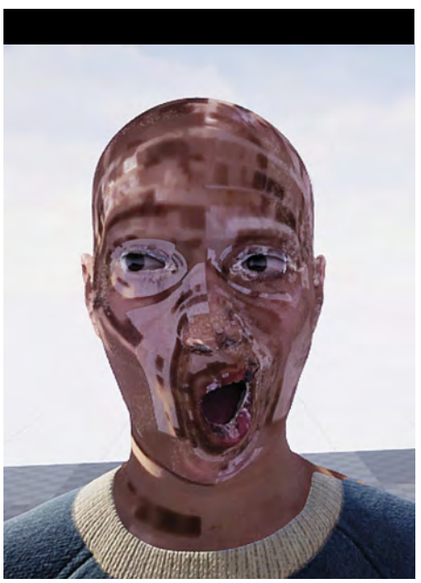

FIG. 11
DIGITAL TWIN WITH WRONG TEXTURE.

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THE BIRTH OF A DIGITAL ACTOR

THABO BEELER, DEREK BRADLEY

Digital humans have become of central relevance in current film production. Out of the five top grossing films released to date (2021), four make use of digital humans of some sort. The outlier, Titanic, was shot long before digital humans were practical, back in 1997. Since then, technology has leaped forward, making photoreal digital humans a reality. Still, the creation of such digital characters poses a formidable challenge and is oftentimes considered to be the Holy Grail of visual effects. The quality bar is tremendously high, since we humans have been conditioned by evolution to scrutinize human faces and even the slightest imperfection can destroy the illusion and trigger rejection of the character—the infamous uncanny valley phenomenon as introduced by Masahiro Mori (2012 [1970]). A digital actor is typically born by first scanning his or her likeness, then building up a digital model, which can then be animated or retargeted to a separate digital character.

SCANNING THE LIKENESS

In order to cross this uncanny valley, the industry relies on reproducing reality as faithfully as humanly possible. To create effects such as explosions, water or destruction, physically based simulation has been invented. To emulate the way light interacts with materials we rely on physically based rendering. To create digital characters, studios rely on capturing real humans at different stages. While this holds in general for the entire human, we will focus on the most challenging aspect in the remainder of this article—the human face.

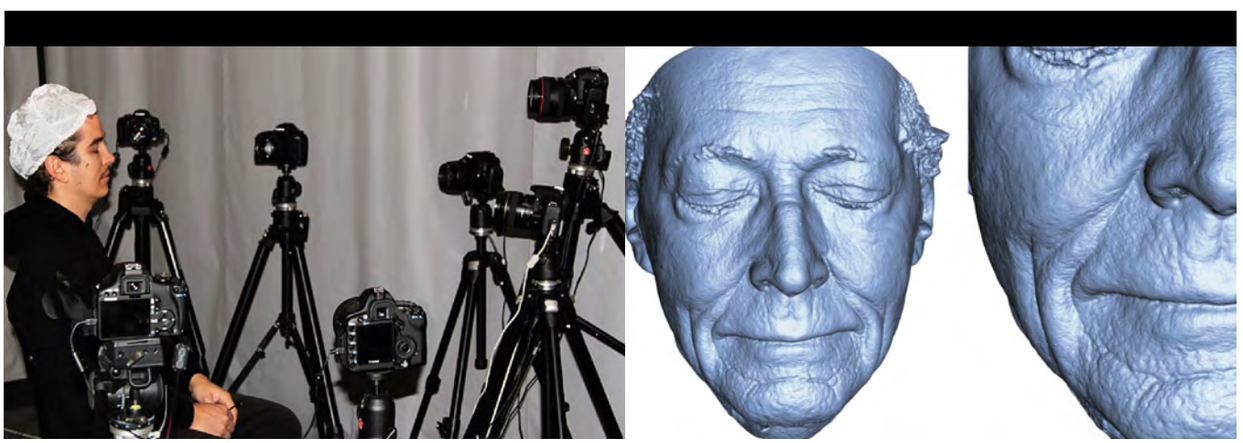

FIG. 1

MULTIVIEW RECONSTRUCTION SETUP AND EXAMPLE 3D GEOMETRY.

First, the shape and appearance of a human face will be acquired using scanning technologies. Shape refers to the 3D geometric structure of the face, where appearance denotes its color and how it interacts with light. Interestingly, the delineation between shape and appearance is scale-dependent, and small scale structures such as skin detail may sometimes be considered geometry or modeled as part of skin reflectance. To acquire the shape, an actor is typically captured in a photogrammetry or videogrammetry setup (Beeler/Bickel/Sumner/Beardsley/Gross 2010). Such setups consist of multiple cameras, ranging anywhere from two to two-hundred, and are accompanied by reconstruction software that converts the multi-view face images to a 3D face model. At their core, these algorithms all function similarly as they rely on the fact that points at different distances from the cameras will project to different locations inside the captured images. Hence, identifying corresponding features across views allows to triangulate them in space to recover their 3D position. While there are other methods that employ more advanced hardware for 3D scanning, such as structured light (Weise/Li/Van Gool/Pauly 2009) or depth sensors (Li/Yu/Ye/Bregler 2013), nowadays passive photogrammetry has become the method of choice since it is highly accurate and requires relatively inexpensive hardware.

As indicated, shape alone is not sufficient to render realistic images since it lacks the appearance information. Skin exhibits very intricate appearance properties due to its physical structure, which makes both acquisition and reproduction very challenging. A fraction of the incident illumination is reflected off the top layer of the skin, the so-called stratum corneum, causing the highlights called specular reflections. How much light is reflected depends on the incoming light direction relative to the local orientation of the skin surface. These reflections preserve the color of the light source, since the rays do not interact with the lower skin layers at all. The rest of the incident light traverses the stratum corneum entering lower skin layers, specifically epidermis and dermis. While it travels through this volume, bouncing from molecule to molecule it gradually changes its color as skin absorbs certain parts of the light spectrum more than others. At some point it will exit the skin again, now appearing flesh colored. The exact color depends on the parts of the skin it travelled through and the distance it covers. This property is called subsurface scattering and is the reason why our skin appears soft and translucent. To measure these reflectance properties, typically studios rely on a lightstage, which is a large device that allows to illuminate the face from a large number of light directions (up to several hundred) in a controlled way (Debevec/Hawkins/Tchou/Duiker/Sarokin/Sagar 2000). By observing the varying appearance at a specific point on the face lit from multiple of these light sources, it is possible to estimate the reflectance properties of the face, such as albedo (color without shading) or specular attenuation. The need to be captured in two different setups—one for shape and model building (described next), and one for reflectance—is obviously suboptimal and recent research has suggested a way to add appearance acquisition to the well-established videogrammetry setups, yielding a one-stop-shop to digitize the likeness of the human face (Gotardo/Riviere/Bradley/Ghosh/Beeler, 2018; Riviere/Gotardo/Bradley/Ghosh/Beeler 2020).

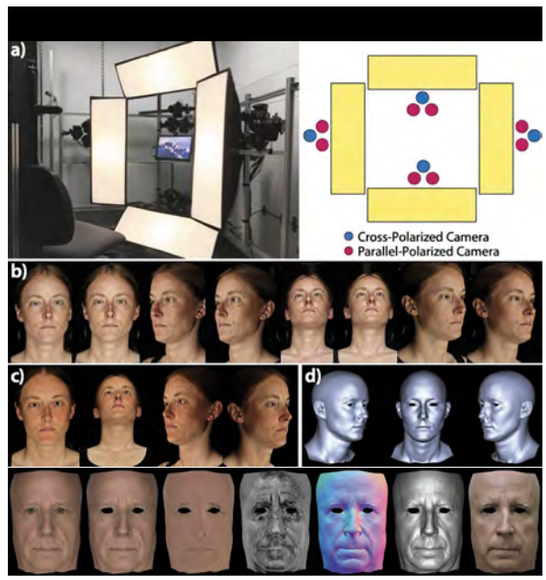

FIG. 2
COMBINED FACIAL GEOMETRY AND APPEARANCE CAPTURE FROM RIVIERE, GOTARDO, BRADLEY, GHOSH, BEELER 2020. A) CAPTURE SETUP, B) EIGHT PARALLEL-POLARIZED VIEWS, C) FOUR CROSS-POLARIZED VIEWS, D) RECONSTRUCTED GEOMETRY. BOTTOM: EXAMPLE RECONSTRUCTED APPEARANCE, INCLUDING (FROM LEFT TO RIGHT) ORIGINAL IMAGE, RECONSTRUCTED RENDER, DIFFUSE ALBEDO, SPECULAR INTENSITY, NORMALS, HIGH QUALITY GEOMETRY, ANOTHER RENDER UNDER DIFFERENT LIGHTING. © DISNEY.

MODEL BUILDING

The scanning technologies introduced in the previous section are employed to capture a human actor performing a number of expressions. How many and which expressions depend on the requirement of the model building stage (also known as *rigging)*. The typical approach is to model the human face holistically using a *linear blend-shape model*—a strategy that represents all facial expressions as a linear combination of a set of base expressions (Lewis/Anjyo/Rhee/Pighin/Deng 2014). After scanning the base expressions and converting them into a common mathematical representation where vertices correspond between shapes, new expressions or entire performances can be created and animated by manipulating the weights of the base shapes in the linear combination. These models are extremely robust and intuitive

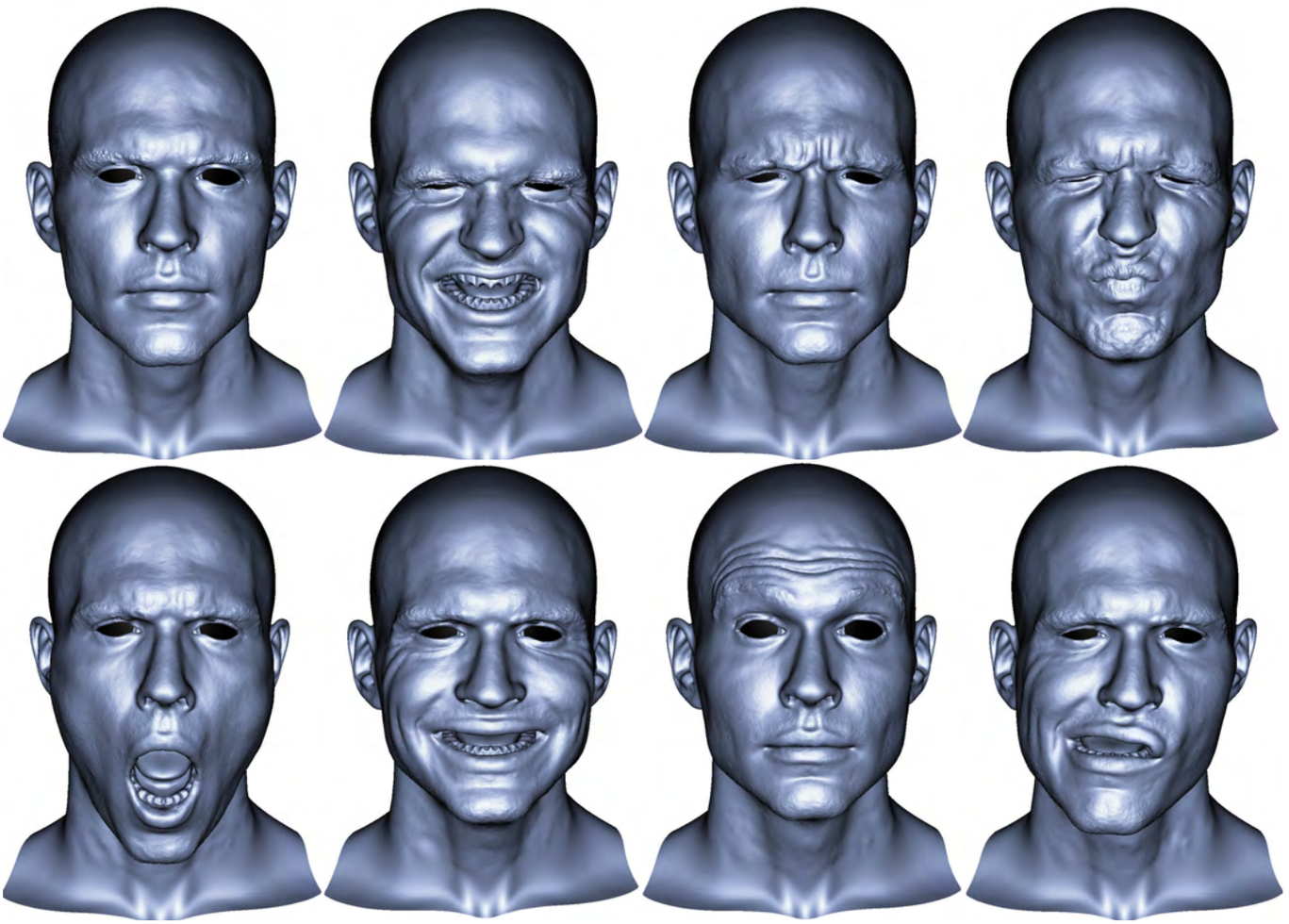

FIG. 3
EXAMPLE FACIAL EXPRESSIONS THAT ARE SCANNED USING MEDUSA TO FORM AN ACTOR MODEL. © DISNEY.

for artists, yet they require to capture a large number of base shapes in order to provide sufficient flexibility and expressiveness. For example, a model consisting of two shapes, say neutral and smile, will be able to express these two shapes and any shape in-between, such as a half smile, but it will not be able to express, for example, a frown. Hence people rely on sampling the human expression space as systematically as possible, oftentimes following the *Facial Action Coding System* or FACS system as introduced by Ekman and Friesen (1978). This system isolates facial motion into atomic "Action Units" (AU) as a function of the underlying muscle structure. For example a smile may be produced as a combination of

AU 6 (cheek raiser), AU 14 (dimpler), AU 15 (lip corner depressor), AU 17 (chin raiser), and AU 24 (lip pressor), among others (Schmidt/Cohn 2001). As a result, global blend-shape facial rigs typically require the acquisition of hundreds of base shapes. The challenge of this system in practice is, however, that humans are typically not capable of consciously activating individual muscle groups. Furthermore, since most scanning systems are seated, effects such as secondary dynamics due to motion are not captured and hence cannot be modelled. Nevertheless, building an actor model from a fixed number of scanned base shapes is still the method of choice for most productions today.

To overcome some of the limitations of global blend-shape models, recent research has proposed more flexible *local* face models, which model the deformation of faces in smaller local regions (Tena/de la Torre/Matthews 2011; Wu/Bradley/Gross/Beeler 2016). This allows to obtain more variation in the combined facial expressions from fewer scanned base shapes, but this approach comes at the cost of robustness, as inconsistent behavior across different local regions can result in uncanny shapes that no longer resemble faces. Such a problem, however, can be alleviated by considering spatial regularization and the global anatomical structure of the face, in particular modeling the expression-specific skin thickness between the skin surface and the bones (e.g. skull and mandible) (Wu/Bradley/Gross/Beeler 2016). Such an anatomical local face model has become a new option for digital face modeling in recent film productions.

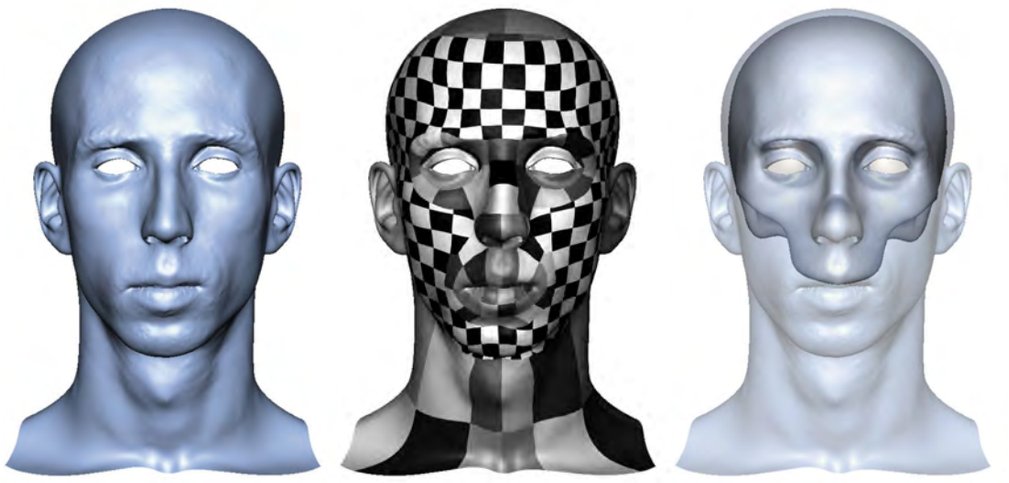

FIG. 4

LOCAL ANATOMICAL FACE MODEL FROM WU, BRADLEY, GROSS, BEELER 2016, SHOWING THE FACE GEOMETRY, THE DISTRIBUTION OF SKIN PATCHES, AND THE UNDERLYING BONE STRUCTURES. © DISNEY.

PERFORMANCE ANIMATION

Once an actor's face model is built, it can be animated by artists using the rig to create novel performances for the digital avatar. However, obtaining precisely accurate facial motion is extremely difficult by hand, and oftentimes digital characters that look realistic in still life, suddenly look uncanny when they move or speak. For this reason, it is customary to also capture performance animation from the real actors, and map this onto the digital character.

Performance capture has a long history, and by now most people are familiar with the idea of motion capture suits for body tracking, where actors wear tight fitted clothing covered in retro-reflective balls that can be tracked using infrared cameras. This notion of "sparse" mo-cap is then translated into full body character animation. For the case of facial performances, similar sparse motion capture has been achieved by painting small black or colored dots on the actor's face and tracking them in video. This provides a low-resolution repre-

sentation of the facial performance, which can be used to approximately drive the higher-resolution actor model. A major drawback of marker-based performance capture is the need to place the markers on the actor's face, which not only requires time, but also requires the makeup artist to place the markers in exactly the same locations from day to day over the course of a production. Furthermore, the result is only a rough approximation of the facial motion, since accurate information can only be obtained at the marker locations. For this reason, follow up research focused on markerless "dense" performance capture of faces (Beeler/Hahn/Badley/Bickel/Beardsley/Gotsman/Sumner/Gross 2011), which uses high resolution synchronized video cameras and tracks the face at the skin pore level, yielding up to a million accurate point locations tracked for each frame of a performance. Such a system, called Medusa, was developed by DisneyResearch|Studios and was awarded an Academy Science and Technology Oscar in 2019.[1]

FIG. 5

SEVERAL FRAMES FROM AN ANYMA PERFORMANCE CAPTURE, SHOWING THE INPUT WITH WIREFRAME RESULT OVERLAID (TOP) AND STABILIZED GEOMETRY WITH RIGID SKULL MOTION REMOVED (BOTTOM). © DISNEY.

Markerless facial performance capture systems like Medusa typically require a well-controlled studio setup, consisting of many cameras, bright uniform illumination, and the actor is usually required to stay seated with their head in a fixed position—all in an effort to make the complex problem tractable. In order to allow a more "unencumbered" performance, more recent research has investigated model-based performance capture, where an actor-specific motion prior is used during the reconstruction process (eg. Tewari, Zollöfer, Kim, Garrido, Bernard, Perez, Christian 2017). This prior is often just the actor model (or rig) built from the facial scans as described above. Optimizing for the model parameters directly to match the video (so-called 'analysis-by-synthesis') is a convenient way to recover the performance, since the output is already in the required format (e.g. mapped onto the actor rig). Using the prior also constrains the set of possible facial shapes that can be reconstructed, and this allows to lessen the physical burden, allowing performance capture using less cameras (even just 1), and in less constrained environments like outdoors. Along these lines is the Anyma performance capture system,[2] developed by DisneyResearch|Studios, which uses the anatomical local face model mentioned earlier (Wu/Bradley/Gross/Beeler 2016) as the prior. This approach provides among the highest quality 3D facial performances and has been used in several recent film productions.

1 https://studios.disneyresearch.com/medusa/ (02.02.2022)

2 https://studios.disneyresearch.com/anyma/ (02.02.2022)

RETARGETING

There are several practical scenarios for creating digital actors. One very common one is when there is a need for a digital character that does not exist in the real world, but can still be "performed" by a real actor (e.g. Marvel's Hulk performed by Mark Ruffalo). In such scenarios, a digital version of the actor's performance is generated, and then transferred to the ultimate digital character seen on screen—a process known as performance *retargeting* (Ribera/Zell/Lewis/Noh/Botsch 2017).

When retargeting a human actor performance to a separate digital character, it is common practice to undergo most of the process of scanning and model building for the live actor, even though they may never appear on screen. This helps to reduce the problem to a purely

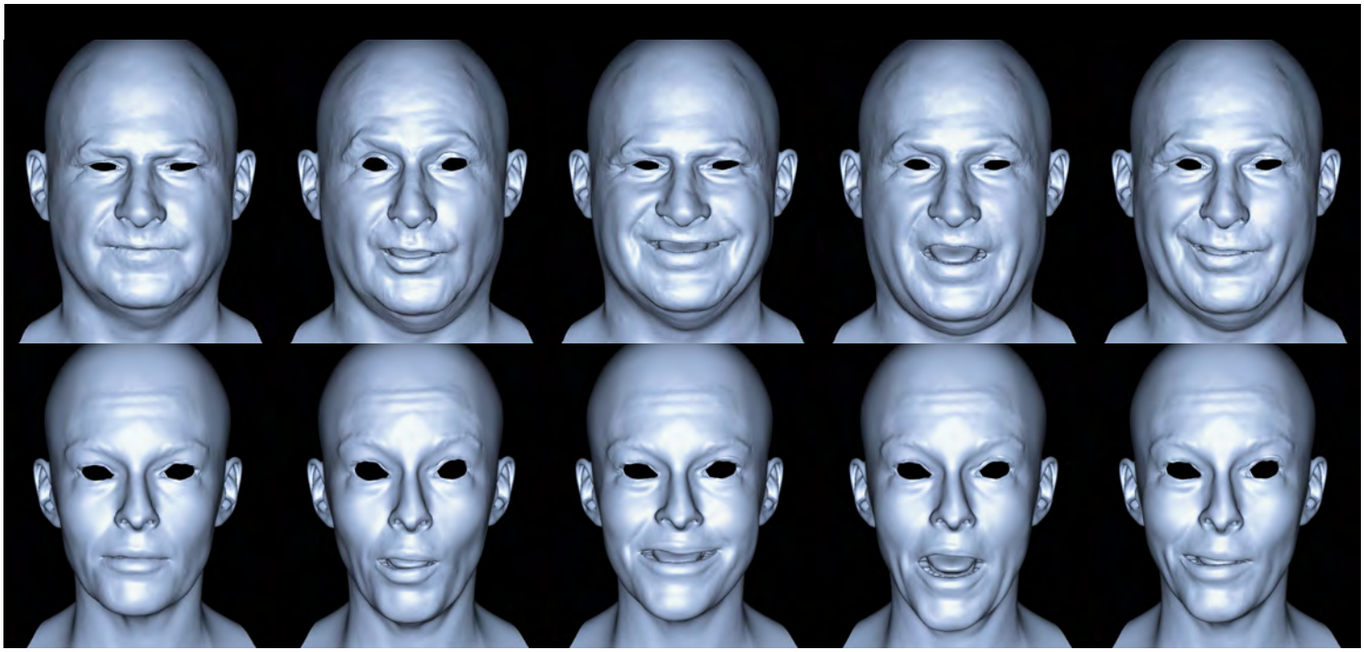

FIG. 6

SEVERAL FRAMES OF A PERFORMANCE RETARGETED FROM THE SOURCE CHARACTER (TOP) TO A TARGET CHARACTER (BOTTOM). © DISNEY.

3D geometric one—how to map the deformation of one 3D face (the source) onto another (the target). The problem is challenging because oftentimes the source and target faces have different proportions, different dynamics and could even have very different bone and muscle structures (for example, a human mapped to a dragon). Several different methods for performance retargeting have been developed over the years. The most straightforward approach is to build complete, identical blend-shape models for both the source and target characters, and once the captured performance of the source actor is modeled by a time series of blend weights, the same weights can simply be used on the target blend-shape model to obtain the retargeted performance. The obvious downside of this approach is the time and effort required to build two complete and expressive blend-shape rigs, carefully crafted such that the expressions artistically correspond in the desired way. But once the models are constructed, large numbers of performance sequences can be readily converted from the source character to the target in no time, and thus this approach is popular in production environments.

When constructing multiple blend-shape models is impractical or otherwise unattractive, an alternative approach is to retarget the surface motion directly. If the source and target characters do not differ greatly in proportions, the time-varying per-vertex

displacements of the source performance can be directly added to the target neutral face. This approach, often referred to as *delta transfer,* is particularly handy when the target character should retain the fine scale details (e.g. expression wrinkles) of the source actor. When the source and target geometry are not compatible enough for simple delta transfer, a common, more elaborate approach is *deformation transfer* (Sumner/Popovic 2004), where the set of transformations induced by the triangles in the source mesh are transferred to the triangles of the target mesh, and the target vertex positions are then solved as an optimization problem. While offering flexibility in the performance transfer, this method is sometimes prone to geometric artifacts such as pinching and folding of the surface when the deformation is extreme. Compared to the blend-shape weight transfer method described first, these direct transfer operations do not require elaborate character rigs but do require a spatial correspondence between the source and target faces, and the resulting retargeted performance can be difficult to edit as no rig exists. In practice, many people use some form of hybrid approach, where large scale deformation is retargeted using a *reduced* blend-shape model of limited size and expressivity, and then finer scale details are retarged with a direct method, in some sense retaining the best of both worlds.

CONCLUSION

In this article we discuss the birth of a digital actor, involving several important steps like scanning the likeness, model building, performance animation and retargeting. Each of these steps has seen tremendous growth in technology and research over the last decades. With every new innovation, we get closer and closer to being able to cross the uncanny valley, and perhaps some digital avatars already have.

Despite the progress, researchers continue to push the limits of "actor to avatar" technology. One current drawback is that most methods for high quality performance capture require a lot of processing time and are thus executed offline after the performance video has been recorded. In this era of real-time virtual production where film-makers are eager to direct digital characters in digital environments in real-time,[3] the next big challenge will be production-quality face capture at real-time frame rates, from a single camera directly on a film set. While some of the latest capture methods do achieve real-time performance (Feng/Feng/Black/Bolkart 2021), they do not yet reach the quality of offline approaches. Still, with the speed that technology is developing in this field, we likely won't have to wait much longer.

3 https://www.fxguide.com/fxfeatured/how-virtual-production-worked-on-set-of-the-lion-king/ (02.02.2022)

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HUMANIZING VIRTUAL PEOPLE

MATTHIAS WITTMANN

When we talk about virtual humans in real-time space, we often refer to them as Avatars. However an Avatar is only a digital representation of an actual existing person, driven by that person. Autonomous virtual humans on the other hand are virtual beings that are controlled by "themselves" through artificial intelligence (AI).

Currently there is a lot of talk about AI and we constantly hear buzzwords like "Machine Learning", "Neural Networks" or "Deep Learning". But what is AI? One definition is the theory of developing computer systems able to do tasks that normally require human intelligence.

A lot of AI is being used for understanding processes and then using that knowledge on other merely similar (but not the same) processes. Facial recognition is a good example: Once an AI system has been "trained" on enough human faces it will be able to recognize a human face on a picture, even if it hasn't seen that particular face before. This is possible because during training the AI system is learning more abstract information about these images. For example: humans do have two eyes, a nose between but below the eyes, one mouth centered under the nose … and so on. So what happens if a Zyklop is in the picture? The cool thing with AI's is that they never just give you results based on "yes" or "no". They return probabilities. And they do that very well. So when an AI sees a Zyklop it will most likely return something like a 65% probability that it is a human face. This behavior by itself feels very human. Of course you can also get wrong results from an AI. Its skills to interpret unknown information depends on the complexity of their "training".

So why don't we already have perfectly AI driven robots or virtual humans if AI's are so great? That's simply because reading and interpreting is easier than producing. Reading an emotion from a person's body language or face or even from the content of their spoken words is much easier than coming up with an appropriate emotional reaction: The right body or facial pose, motion or gesture. And that is simply because the training of reading is easier than the training of doing. Reading emotions versus creating emotions. For me it is all about creating emotions. This article will illustrate where I was in that process in 2019 and how I got there.

After receiving my diploma from the Filmakademie Baden Württemberg in Ludwigsburg, Germany, I started in 2000 as a character animator in the movie industry. In 2008 I became the animation lead of "The Curious Case of Benjamin Button". Working a lot with the modeling department I became something like an expert for human facial anatomy, facial muscle movement and skin micro motion. Over the next few years I was mostly involved with digital human animation and development like "Tron Legacy", "Virtual Tupac" (the Coachella hologram) and "Maleficent".

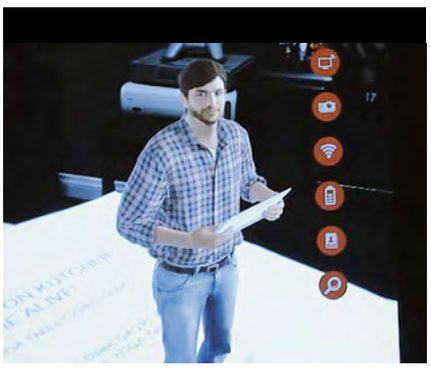
While working in animation I always spent some time on coding tools. Not only because it was helpful, but also because it was a lot of fun! I am not a schooled programmer, so writing code for me is like playing a game. If it works, I won. And as opposed to

animating, coding gives you a clear result. Either it works, or not. Sure, you can optimize code to work more efficiently (which is fun too), but the results stay the same. Animation on the other hand is always open for interpretation.

In 2010 I started using Unity at home to create little games for my iPhone. And while I mentioned before that coding means fun to me, coding for real time engines is really exciting. Four years later in 2014 a friend of mine asked me if I would be interested in joining a company to develop interactive virtual humans for Augmented Reality (AR). That is when I switched from film productions to realtime development.

VIRTUAL HUMANS IN AR

The first project I was involved in was a 30cm virtual Ashton Kutcher presenting a new tablet right in front of you on your desk. You could watch him in AR through your own tablet. I added a "look at us" logic to make him, well, look at us whenever he talked to us. My knowledge from high-end film productions came in handy even in the low-res world of mobile real time. It was important to me that the way he looked and moved would feel natural, which was tricky considering he consisted of only about five polygons.

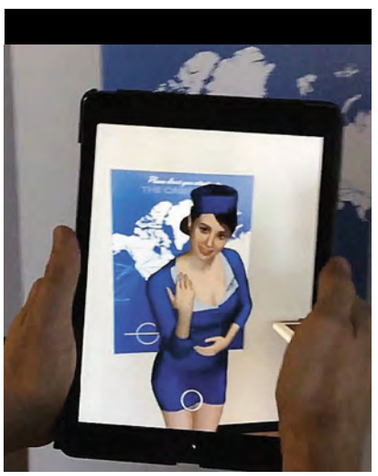


30CM VIRTUAL ASHTON KUTCHER

The next AR project utilizing a tablet as a window to the augmented world was a life size stewardess promoting an airline. She did not have to talk but be friendly and invite us to the airline's booth at a convention. Aside from a 'look at us' mechanism I added reactions to her based on our distance. When we were in reasonable range she would beckon us and if we got closer I let her smile.

Both of these AR projects felt pretty successful from an emotional standpoint. But now I became curious about how far one could go with Virtual Reality (VR). For a start one could use better graphics since serious VR systems were still connected to a PC. And how immersive would it feel sharing the same three dimensional space without just a tablet as a window?

First I tested it on an old film asset: a human head with a few really well modeled shapes for eyelid deformation. It was the first time for me using Unreal Engine and I programmed the eye and head rotation in a way that the head would look in my direction in VR. The results felt mind blowing realistic. Of course, it did not look photorealistic, however the presence of seemingly another being was undeniable.



A LIFE SIZE STEWARDESS PROMOTING AN AIRLINE

THE SESSION

This confirmed that one could go much further with the given technology and in 2015 for my next project "The Session", I developed a full-size virtual human in VR: An old professor. This time I let the character speak to the player whose reactions and decisions determined how the story proceeded.

To establish communication between player and virtual human I decided to go with gesture recognition. The professor was able to read the player's nodding and head shaking as "Yes" and "No". All AI features were developed based on fuzzy logical decision trees. The whole system was supposed to (technically) fake human behavior.

The professor was able to memorize objects and could also forget them if he would not see them for a while. Just as humans favor certain features in the images they perceive of the world around them (motion, contrasts, vanishing lines) this vision AI was supposed to do the same. Although I did not get to implement the other two elements, the Professor was able to notice motion, especially if it was fast or sudden. While he was not able to notice static objects in his peripheral vision, he did notice them when they moved. He also was aware of the fact if the player was looking at him, but only if he was looking at the player at that moment.

THE SESSION

I did not create a locomotion logic at this point, meaning the Professor would not be able to avoid a player and could potentially walk right through them. But he nearly never did since the story was designed to predict where the player actually was. the AI only walked into spots where it knew the player could not be. For example: The Professor told the player to go to a pillar in the room. If the player did not go there the AI would not change location. However, if the player went over to the pillar the AI would know that the player just freed up space and the Professor could move without the danger of intersecting with the player.

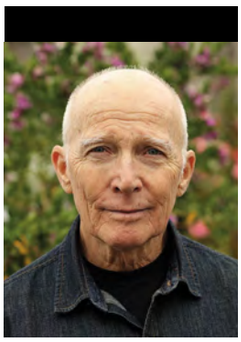
Aside from the actual game part I also created a test-level where the user could just "hang out" with the professor and take a closer look at him. While he would not move or engage in a conversation with the player, he still would react to their presence.

The professor would look at them when they entered his field of view, he would nod or shake his head when the player did and would react confused and even annoyed when the player got too close. These reactions felt very personal giving the player the impression that this being had real feelings.

MAN AT A BUS STOP

In 2018 I got the chance to design and create an even more advanced interactive virtual human in VR. The project was called "Man at a Bus Stop". I had several goals this time. One was having a way more complex environment, to showcase that a complex interactive virtual human in VR could be used in an equally complex environment without overwhelming the computational power of a decent, yet not overly hi-end PC. Other goals were adding hair, voice recognition and developing an emotion engine. Also, I decided to update the user interface giving the player hand representations this time.

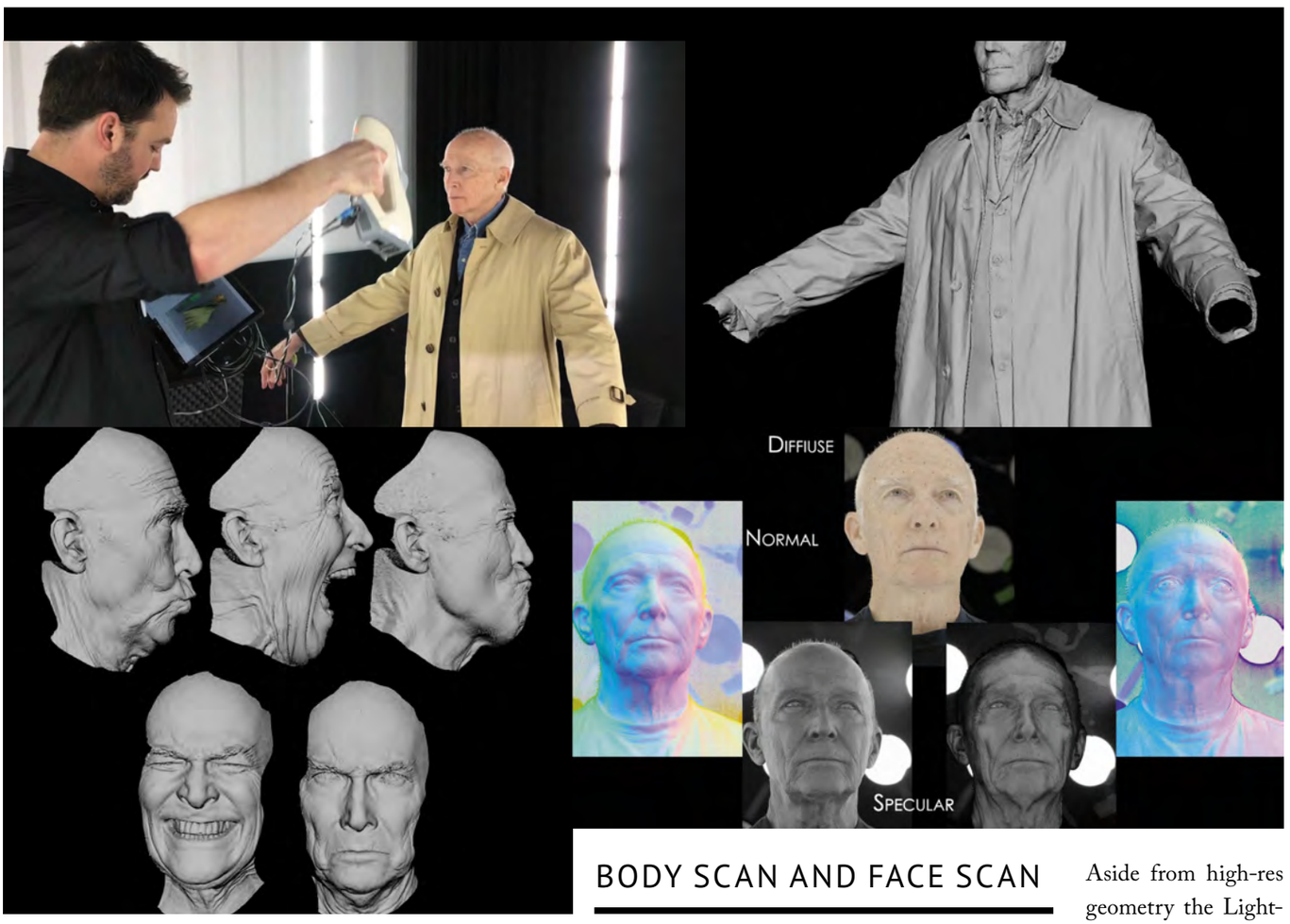
The user experience was based on two principles: firstly the character AI should be as humanlike as possible not only in terms of look and behavior, but also in abilities. This AI should not be all-knowing. The human-AI should only see, hear and feel what a human would. No eyes on the back of the head… Secondly the user should not have to "learn" anything. Anything they would be able to do should come naturally to them.



MAN AT A BUS STOP IS BASED ON A REAL ACTOR, TOM FITZPATRICK.

Like "The Session" before, "Man at a Bus Stop" is based on a real actor, Tom Fitzpatrick. We started as we would for film productions. We did an extensive body scan. This time we experimented with a new method using a mobile hand scanner solution. It was based on photogrammetry but would be moved around the subject. The actor had to stay still for a longer time than in a classical volume, however its flexibility was a huge advantage.

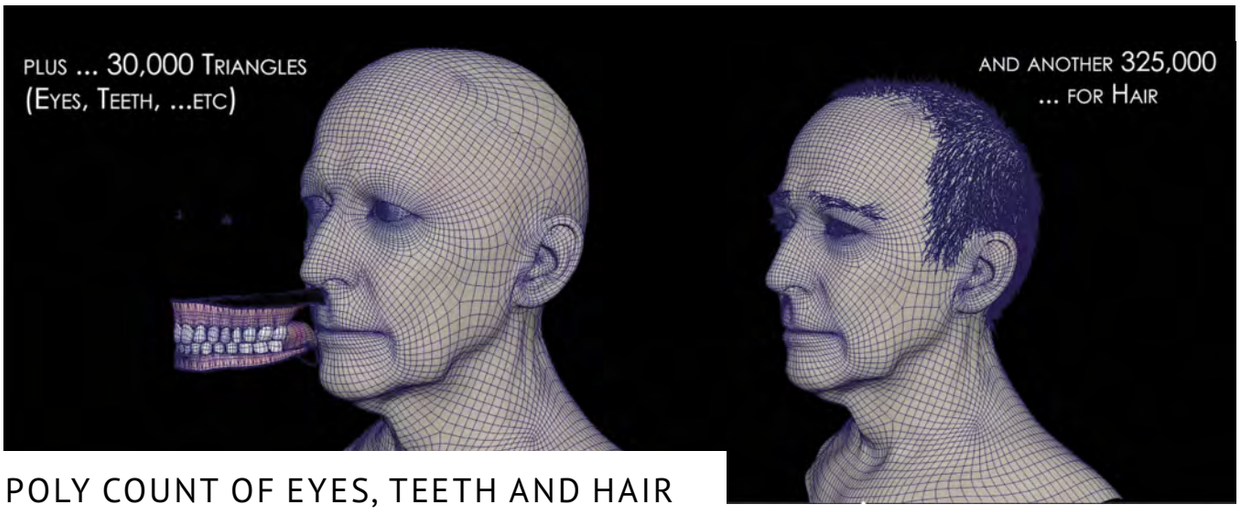
The face was scanned on a light-stage, a system originally invented by Paul Debevec at the Institute of Creative Technologies (ICT) at USC. This process creates geometry that is so precise, it shows every single pore of the actor's skin. The resolution of such scans is very high, 7.5 million polygons in this case. While one would not use the high-resolution geometry for real time, one still gets the necessary information for creating highly detailed displacement maps. Displacement maps can give a low-res geometry the look of a much higher res one, while needing less resources. For that we remodeled the head with a much lower poly-count of 30.000. Then we used a modeling tool that compared the two heads. This produced a black and white image that represented the delta between high res and low-res geometry: the displacement map.



BODY SCAN AND FACE SCAN

Aside from high-res geometry the Light-stage scan produces also other very important maps that are needed for shader creation like defuse, specular and normal maps. To create realistic looking skin, we utilized Unreal Engines ability for sub surface scattering (SSS) shader models. Skin reacts strangely to light. It absorbs a lot of it and reflects it in a more diffuse way. Without an SSS shader it is very difficult to create this look. That is why digital humans looked like "plastic" for a long time. In real time graphics they often still do. The main reason is that even though this kind of shaders do exist now, at least in some game engines, they need more rendering power, which usually results in lower frame rates.

Since you cannot just scan hair, it had to be created separately in Maya using XGen. Luckily Tom had very short hair, so we did not have to deal with dynamics. Nevertheless, in the end the poly count of just the hair was ten times higher than that of the rest of the face, including eyes and teeth.



POLY COUNT OF EYES, TEETH AND HAIR

At this point we should talk briefly about the Uncanny Valley, the effect that we subconsciously accept simplified representations of humans more than representations that are only "almost perfect". The question is, how to overcome the uncanny valley? What makes it uncanny? There is no simple answer. Anything can pull you out of the illusion, look, motion and even the voice.

Let us assume we start from a really good 3D model of a person which has already decent shaders. Most of the time the trouble starts with the eyes. They are, as some may say, the gateway to the soul. Poorly designed eyes can be disturbing even when the character is not moving at all. Motion is another factor. The most perfect looking eyes will still break the illusion if they do not move and deform the surrounding skin like we are used to. And then there is the rest of the face. A human face is very complex and to recreate it with computer graphics is only accepted by the audience if it moves as a whole. If you only pose the mouth to the spoken words but do not move the rest of the face accordingly, the illusion falls apart. Everything in the face, and the whole body for that matter, is interconnected. There are specific ways how our head moves while we are talking, and there is a way how our body moves when our head is moving, and vice versa. If you break any of these relationships, you run into danger of falling deep into the uncanny valley.

Once things are moving, deformation and therefore volume preservation becomes a factor. When pulling a rubber band, it becomes thinner. The same basically happens in the face, you pucker your lips, the cheeks are getting stretched and flatten against your teeth. Moving parts of a face and not taking care of volume preservation will be subconsciously noticed very quickly. There are even more possibilities to break the illusion, yet these belong to the most important ones. If not taken care of properly you get reactions like "Something is off, I can't tell you exactly what it is, but it's not real".

To make sure to have proper facial motion and deformation I went with DI4D to do a facial performance capture. A volumetric scan like that returns a deforming facial geometry of the complete performance. Such performance clips are very large and it was clear that I would not have the bandwidth in VR to run it on high frame rates. So we used an algorithm from an old siggraph paper to convert the complete performance into a small number of animated blend shapes. However, blend shapes and animation created through a process like that can't be edited. The data looks too random. We still managed to enhance the rig to allow for adding emotions and moving his eyes interactively.

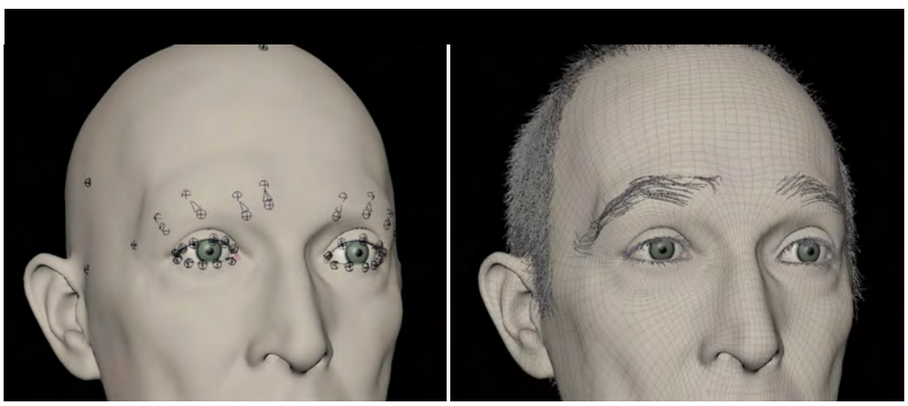
At that time high quality scans like these were not possible to be captured simultaneously with body performance. So we did a separate body motion capture session of the same actions. It is not an easy task for an actor to reproduce the same action twice, once sitting in a chair and once moving on stage. Ideally the body capture should happen before the face capture session and both should happen on the same day. That way it is easier for the actor to understand and remember the context when he has to sit still. And believe me, it is a lot to ask from an actor to perform 'lively' without moving their body.

FACIAL AND BODY PERFORMANCE

Now we had two separate captures. To connect the facial and the body performance, I spent some time in editing. It was important that his facial rhythm would fit to his body motion. One could not just line up the voice recordings of the two captures, since length and rhythm was always slightly different. So the key was to find the most important 'beat' in his performance, and line it up to that.

Once again the hair had to be dealt with separately. A performance scan moves the skin, but the hair geometry does not know about that. So we had to design a special joint setup that would move the hair together with the head. Aside from the scalp that also included the eyebrows and eyelashes.

In order to make a character feel naturalistic within an experience like "Man at a Bus Stop", multiple layers of interactivity come to play. First there is the actual story line. To give the illusion of choice, the story has to branch from time to time. Branching often feels better for the user, but also creates more work. Key to an efficient branching design is that it leads back to the main track as soon as possible. Else the amount of options will increase exponentially.



A SPECIAL JOINT SETUP THAT WOULD MOVE THE HAIR TOGETHER WITH THE HEAD

Aside from this obvious kind of interactivity I added layers of behavior to make Tom feel more like a real human. For once there are actions the character can do simultaneously with the main performance. Turning towards us when we are not right in front of him is one of them, or leaning away from us when we get too close. These motions have to be well balanced. The eyes, head and body turn towards us with individually tuned speed, acceleration and precision.

There are also more subtle actions to keep him "alive", that react interactively too. His breathing and eye blinking frequency change based on his current mood. So does his mimic.

Like before with the professor for "The Session" it was a no-brainer to add emotions to the character again. Though this time the emotion engine was more elaborate. Rather than changing the face and pose just based on e.g. distance, Tom would now remember his own emotions and at times even holding a grudge for a while. That indeed was a very powerful update that added a lot to his "humanlike" feel.

ADDING VIRTUAL HANDS

In terms of game play and controlling the action, dealing with the interaction of humans and virtual humans is challenging. Since players in VR are sharing the space with the character it is harder to predict what they may do. Some people new to VR, are often overwhelmed and have a hard time focusing on the story. While others are quickly bored if there is not enough "action". Some players try to break the system, others do not move at all.

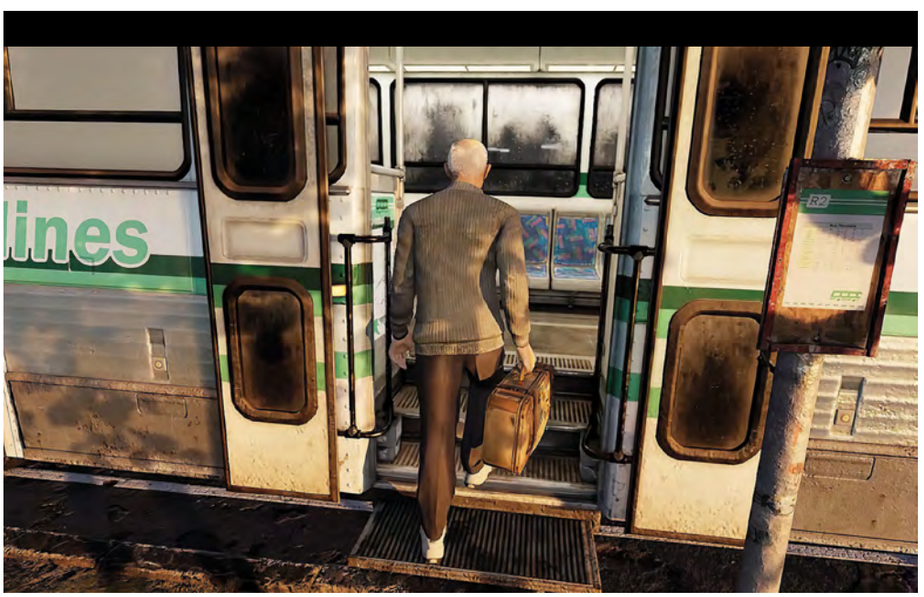
So how to deal with that situation? First of all you need to have a basic understanding of user psychology. What attracts them? What bores them? How can you gain their attention? The easiest way is to follow the concept of reward and punishment: The character asks the user to do something. If the player fulfills the request something entertaining happens. When the user moves too far away from that scene just fade to black. (Don't fade to black, it is mean!)

Adding virtual hands as user representation to "Man at a Bus Stop" was well received. To avoid breaking the immersion the hands were designed with situational awareness, mostly based on the distance to Tom and the area one would reach out to. That way it was not necessary for the user to learn anything. When someone reached out to Tom the hand naturally posed in a way that made sense. An interesting result was that even though the hands clearly changed shape while moving, everybody just accepted this behavior as normal.

Having said this, I mentioned above that players are hard to control in VR. Give them VR hands and see what happens. The reward and punishment principle becomes blurry. The AI reaction to touch is rewarding, but it can also disturb the story, for example when touching his face while he is speaking. Tom reacts clearly unhappy when you poke his nose and while some users are feeling bad about that, others are motivated by it. Most players treated Tom "respectfully", yet some twirled their hand inside his head, only to see if they could break him.

Interesting was that almost nobody would actually try to walk through these virtual humans, neither the "Professor", nor Tom. There seems to be a natural barrier when VR space and characters become too real.

When players used the system as intended, by playing the story and listening to Tom, "Man at a Bus Stop" became very rewarding. The fairly hi-end design and the sophisticated Emotion Engine made it feel very intimate. Tom came already very close to being a very human-like virtual being. Who knows what lies in the future …



THE FAIRLY HI-END DESIGN AND THE SOPHISTICATED EMOTION ENGINE MADE IT FEEL VERY INTIMATE.

DOUBLE TROUBLE. DIGITAL AVATARS ON STAGE

CHRISTIAN ISELI

INTRODUCTION

The interplay of technologies from the film and gaming industries enables digital avatars to climb onto the stage. However, both media have prerequisites that affect the realization of digital characters. In film, it is primarily realism, both in terms of photorealistic surface textures arising from the depictive tradition and in terms of precise human motion, resulting from the tradition of animated films, wherein humanized movement contributes significantly to the audience's ability to empathize with a character. The realistic concepts lead to the ideal of lifelike digital humans as well as of animated movements and facial expressions that are confusingly human-like, regardless of whether characters are stylized toons, realistic animals or human characters. In computer games, on the other hand, the focus is on interactivity, and this results in the priority of ultrashort response times, to which other aspects such as graphic style and the impression of realism in texture and movement are subordinated. The same priority also applies to the performing arts, where the overriding premise is the experience of a live event with physically present actors, singers or dancers. Digital avatars on stage increase the demand for real-time performance even further, because not only the rendering of the characters, but also the animation based on performance capture needs a final output in real time. In distinction to this, movements in games are preproduced. Motion capture data is first recorded, cleaned and optimized in several processes before it is made available for retrieval from databases as animation loops. And in film, everything can be optimized for as long as it takes before the canned version hits the screen. Given these differences, it stands to reason that both in games and especially in the performing arts, photorealistic images have not been a top priority.

The emerging convergence and the increasing use of technology is seen by theorists from the fields of film and performing arts as a distinctive feature of digitalization. While computer games are digital by definition, film has gone through a groundbreaking transition from analog photographic to digital recording. However, theorists have other features in mind when they use the term *digital cinema*. According to Lev Manovich, the constituent element is essentially the combination of real image components (conventionally recorded by means of a lens) with digitally generated 3D spaces or 3D characters. In his view, the hybrid form leads to a particular case of animation film, in which live-action footage is used alongside many other image sources (Manovich, 2001; 2016). In addition, these phenomena can also be understood as defining components — among many others — of the term *post-cinema* (Denson/Leyda 2016, Iseli et al. 2021).

An approach similar to that taken in film studies is also used when determining the theoretical concepts of *digital theater, digital dance* or *digital performance*. These new forms of expression are primarliy defined by their hybrid quality, to which digital technology is

intrinsic (Dixon 2007; Salter 2010, Boucher 2011). In order to distinguish digital theater from traditional theater as well as from a broader sense of digital performance, Nadja Masura lists the presence of digital technology, both in the creation of a performance and its interactivity as a primary characteristic. She also assigns importance to fundamental ingredients that make up theater in the first place, such as the presence of verbal communication or the co-presence of audience and actors. (Masura 2020). Another parallel to film studies is that the integration of new digital technologies can also be seen as one of many defining components of *post-theatre* or *post-dramatic theatre* (Lehman 2006).

THE ALIVE, THE DEAD AND THE UNCANNY

In film, there is the traditional distinction between *live-action* and *animation*. The terms clarify how moving images are created. Live-action refers to what happens in front of a running camera that records multiple frames per seconds in the profilmic situation (Souriau 1951) and it usually simply refers to shooting with actors. Whereas animation in the conventional sense describes the process to produce moving images on the basis of single frames that can create the illusion of movement when played back at the standard rate of 24 frames per second (stop-motion animation). If we look at characters we could simply say that either a character moves on its own during the shooting process (and is thus alive), or a non-living representation needs to be set in motion (brought to life) through animation techniques.[1] But from very early on in film history the two basic approaches were mixed and formed a category that later was defined as *live-action/animated* with real actors appearing in cartoon worlds or cartoon characters in photorealistic words. An early example of a hybrid production were the film series *Alice Comedies* (Walt Disney Company, 1923–27), and a very successful historical example later on was *Who Framed Roger Rabbit?* (Robert Zemeckis, 1988). This brings us to the basic constellation that characters played by living actors meet animated or — to follow the logic of the terminology — dead characters, which at the same time appear to be very much alive.[2]

WHO FRAMED ROGER RABBIT?
ROBERT ZEMECKIS (1988)

The hybrid image production, in which a real human acts side by side with a synthetic non-human, has become quite common in mainstream cinema and it certainly has become substantially more popular in the last 20 years. It mainly started in the 1990s — with a few exceptions a bit earlier —, which is due to the growth of computer generated imagery CGI and 3D-animation in the ever expanding area of visual effects (Prince 2011).

The main shift towards realism that has taken place since then, regarding synthetic, animated characters, occurs on two levels: Firstly, in terms of photorealistic surface textures, due to the growing capacities of computer graphics, and secondly in terms of precise human-like movements, based on motion and performance capture technology. With this particular technology, animation films eventually obtained what we would call a proper shooting situation, or in Souriau's terms, a profilmic reality.

1 There are also methods for the mechanical or electromechanical animation of puppets or artificial creatures during a live-action recording process. The associated term here is animatronics (formed from animation and mechatronics, a term derived from robotics). Cf. Flueckiger 2008.

2 The special effects in Roger Rabbit were still basically pre-digital and were done with optical printers, puppetry, and stop-motion animation (Wolf 1995). In computer animation the frame-by-frame technique of analog times is replaced by keyframe-animation.

The growing importance of the live-action/animated genre gave rise to realistic virtual characters at a large scale. However, the term virtual character doesn't necessarily imply a human appearance. But it most certainly means — following the long tradition of animation film — that CGI characters have human-like movements, human mimicry, human-like emotions and human personalities. These anthropomorphic creatures are well-known and their naturalistic appearance and behavior have attained a level of perfection. For example, Golumn from the *Lord of the Rings* and *The Hobbit* franchises (Peter Jackson 2001–2014) or Ceasar from *War for the Planet of the Apes* (Matt Reeves, 2017), both created with the help of performance capture by British actor Andy Serkis.

At the same time, the photorealistic digital human remained the last frontier of the VFX industry. The human look-a-likes that were referred to as virtual humans, virtual actors, synthespians, digital doubles or avatars first appeared only partially, or in short scenes, as early as the 1980s. In the ensuing years they were often kept in the background, multiplied to simulate crowds, as in *Titanic* (James Cameron 1997), or used as digital doubles to avoid dangerous stunts as in *Matrix Reloaded* (Lana and Lilly Wachowski 2002). But as soon as they appeared in larger portions of the films, left the background and aspired to be leading characters with dialogue, close-ups and emotions, they got into trouble. *Final Fantasy: The Spirits Within* (Hironobu Sakaguchi 2001) was the first animation film which was entirely based on photo-realistically rendered characters. But the audience acceptance was rather weak, as it seemed difficult to emotionally relate to the still quite synthetic characters (Butler and Joschko 2009). This is connected to the so-called *Uncanny Valley* effect. First introduced by Masahiro Mori in 1970, the term describes the phenomenon that when artificial characters become similar to humans, the empathy curve of an audience suddenly drops sharply and only rises again when the characters appear indistinctively close to real humans, thus giving the graph the shape of a valley (Mori 1970).

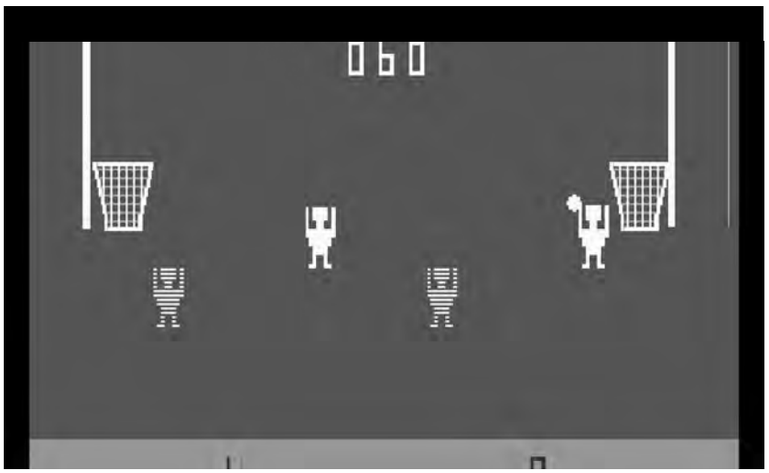
The debate about the uncanniness of computer-animated characters was conducted with vehemence with regard to films such as Robert Zemeckis' *Polar Express* (Robert Zemeckis, 2004), which relied entirely on performance capture technology (Flueckiger 2008, Aldred 2006, Kurtz 2004). But later, due to new aesthetic concepts and the technological progress demonstrated in, for example, *The Curious Case of Benjamin Button* (Fincher 2008), discussions of the uncanny valley effect seemed to recede into the background (Flueckiger 2012, Perry 2014). However, when it came to awakening the dead critical views reached a new peak and led to ethical concerns. In *Star Wars Rogue One* (Gareth Edwards, 2016), British actor Peter Cushing, who died in 1994, was digitally reconstructed and joined the cast again, appearing alongside a digitally reproduced Carrie Fischer.

GEMINI MAN, ANG LEE (2018)

In Ang Lee's *Gemini Man* (2018), the digital twin was finally assigned a leading part. In this thriller, the main character meets a much younger clone of himself. For this purpose, a state-of-the art digital double of Will Smith was produced and made significantly younger. In this context, the actor behind Golum and Ceasar, Andy Serkis, stepped forward in an interview and emphasized, that "there are a few serious problems in that we can create photorealistic characters, that we can digitally rejuvenate actors or digitally retrieve recordings of deceased actors" (Pennington 2019). Labeled by the Rolling Stone magazine the "king of post-human acting" (Hiatt 2014), Serkis cautioned that the technology allows the film studios to do what they want with these digital copies of real humans, and the legal issues seem complicated (Pennington 2019).

PLAYERS, THEIR AVATARS AND LOW LATENCY

In the field of computer games, one thing counts above all else. The graphics that appear on the display in front of the players must be calculated in real time. For decades, this basic requirement has led to a rather modest visual quality. In the first games in which humans were represented, the so-called "sprites" consisted of only a few pixels. They were the non-static elements within two-dimensional games, moving independently of the background and were player-controlled, as for instance in the arcade game *Basketball* (1974). The player controlling his digital representation in the game has been a characteristic feature of computer games from the beginning. And with the increasing complexity of games, it has evolved into what is often described as the player-avatar relationship (Gazzard 2009; Banks/Bowman 2013). It implies a role-play related experience that moviegoers don't expect to have.



BASKETBALL (1974)

With the expanding graphic capacities of computers, the number of pixels per character was on the rise and in the Nineties a landmark shift took place towards 3D graphics and avatars with three-dimensional bodies. Later, games went online, which limited creative animation solutions, due to limited internet bandwidths and the need for the simultaneous representation of actions across a high volume of players. The visual style remained mainly reduced and cartoonish, but the enhanced interactivity through the introduction of "massively multiplayer online role-playing games" (MMORPG) led to an increased identification between gamers and their avatars (Blinka 2008, You et al. 2017).

HEAVY RAIN (2010), *THE LAST OF US* (2013), *DETROIT: BECOME HUMAN* (2019)

Eventually the characters' design became more complex, and the new frontier of photorealism came into play as well. Obviously, the standards here seemed different than on the big silver screen and the uncanny valley never had a comparable significance, as computer games, unlike films, had never been considered a photographic medium and thus were hardly connected to corresponding expectations. But now that the graphic performance passed a certain threshold, cinema has become an important reference, both in terms of visual style and narrative approach. Cinematic Triple A Games that employ a third person view, like *Heavy Rain* (2010), *The Last of us* (2013), or *Detroit: Become Human* (2019) are considered milestones in the development of high-quality visuals and characters.

THE HERE, THE NOW AND THE MEDIATED

The integration of media content has a long and rich tradition in theater and dance and goes back to the 1910s, when film projections began to be included in stage performances. In addition to providing alternate backgrounds or providing additional content layers, the new practices also included the projection of filmed characters (Dixon 2007; Salter 2010). With the introduction of portable video equipment in the 1970s, the inclusion of media content increased rapidly. The use of video also offered the possibility of live transmission, which was frequently used as it corresponded to the liveness of the theatrical event (Georgi 2014). The fact that the video footage was captured live in the same time and space, was—and is—usually made transparent to the audience. Frank Castorf is a prime example of a director who repeatedly emphasized medial play by employing multiple cameras and including live editing (Carlson 2008, Kassay-Schuster 2017). Or similarly, Katie Mitchell who uses video to create an atmosphere of "live cinema", as for instance in *Forbidden Zone* (Mitchell 2014)

FORBIDDEN ZONE (2014) BY KATIE MITCHELL

The step towards digital characters that are animated by means of motion capture technology became possible in rudimentary form in the mid-Nineties through the use of mostly abstract forms. An example of this period is *Biped* (1999) by Merce Cunningham, in cooperation with the artist duo Shelly Eshkar and Paul Kaiser. At that period the motion capture data was often still pre-recorded in order to arrive at optimized animation sequences. Other groups of that period aspired to achieve real-time animation in their performances. Ruth Gibson and Bruno Martelli of the Igloo artist group achieved double appearances of dancers and their "dual identities" in their 2000 performance *Viking Shoppers* (Dixon 2007).

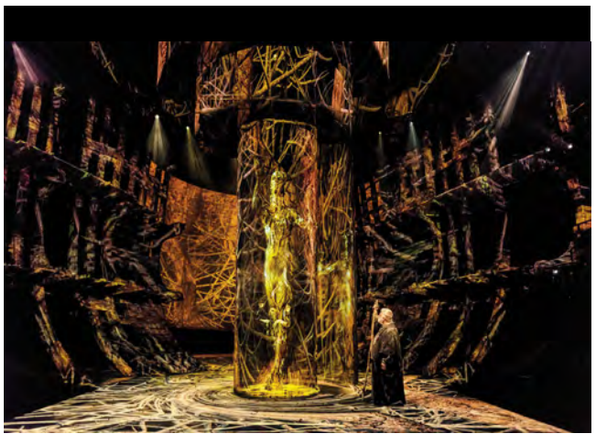
BIPED (1999) BY MERCE CUNNINGHAM

In order to confirm that the avatar's performance is indeed being created live and is not the result of a pre-recording, the audience usually gets to see both the performers (in motion capture suits) and their projected avatars. Even though the technical equipment is capable of a so called rea-time-processing, there is always a slight delay between a movement and its processed and projected counterpart. The so-called latency has been improved considerably, but still today it's always there, close to the threshold of noticeability, but giving the double appearance an additional artificiality, as the avatar seems to inhabit a slightly different time zone.

On large theater stages and with ambitious visual concepts, the required technical effort can reach enormous dimensions. In the Shakespeare anniversary year of 2016, it was the character Ariel of *The Tempest* (Gregory Doran, Royal Shakespeare Company, 2016) that could be experienced as a digital avatar animated live by actor Mark Quartley on stage, entangled in overwhelming digital stage designs. In addition to a large volume, state of the

art performance capture system, this required no fewer than 27 projectors and a massive array of the latest computer technology from the project partner Intel. (Billington 2016, Jimenez 2017).

DOUBLE TROUBLE



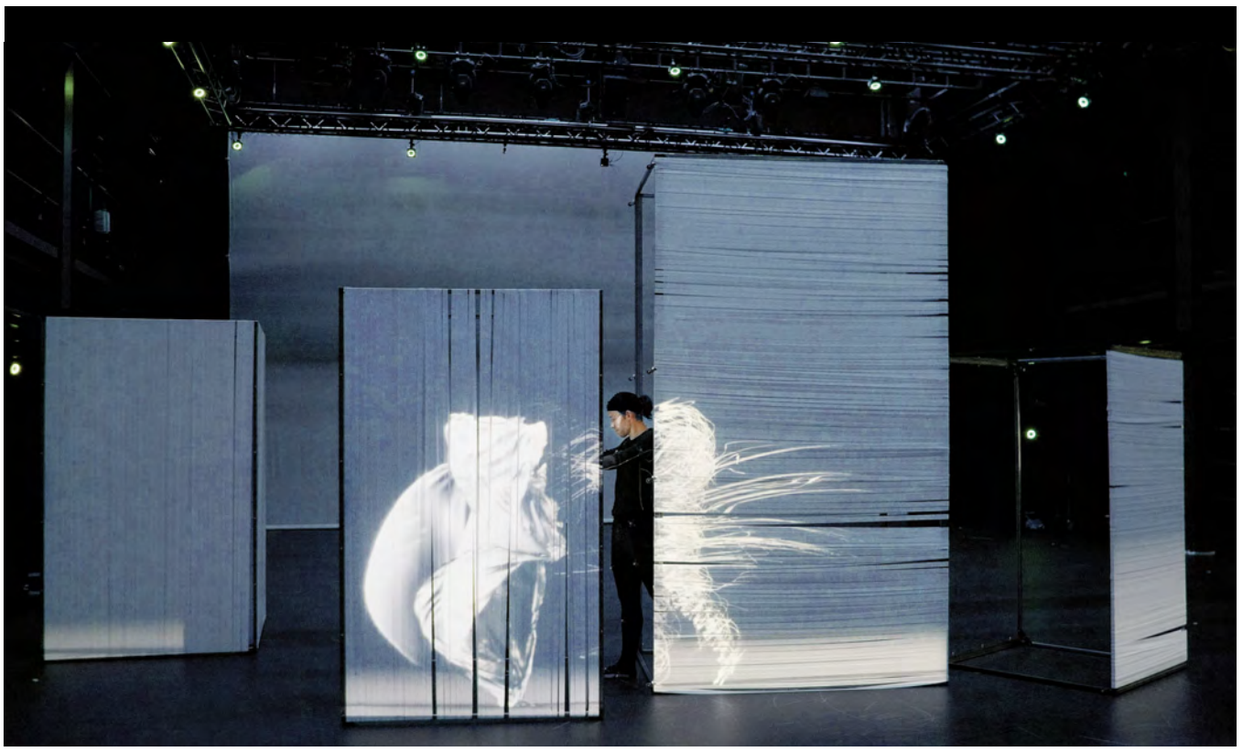
THE TEMPEST (GREGORY DORAN, ROYAL SHAKESPEARE COMPANY, 2016)

In his review of the premiere of *The Tempest,* critic Michael Billington (2016) of *The Guardian* described his experience of seeing the Ariel avatar simultaneously on stage with the actor Mark Quartley. "It is all impressive, even if it creates the odd sense that we are watching a double Ariel" (Ibid). This indeed describes a basic dilemma that inevitably arises when working with digital avatars, when at the same time the live character of the situation is made transparent. Certainly, it would be possible to have only the avatars appear on stage, while the actors' movements could be tracked in a separate room. However, this would deprive the actors of their very purpose for being on stage and prevent the necessary co-presence of the audience. It would also merely look like a preproduced video and not like a prestigious, cutting-edge digital live production. The simultaneous presence of actor and avatar eliminates these problems altogether. The price for this, however, is the effect of duplication that critic Michael Paulson of *The New York Times* referred to as the *"the double event"* (Paulson 2017).

The descriptions of the double effect caused by digital technology is all the more interesting as it seems to echo a more fundamental double phenomenon inherent to performance. In his comprehensive study on the performative arts, Marvin Carlson cites ethnolinguist Richard Bauman who noted that performance always involves "a consciousness of doubleness, through which the actual execution of an action is placed in mental comparison with a potential, an ideal, or a remembered model of that action" (Carlson 2013). And sketching the tradition of double concepts within the realm of digital theater and dance, Steve Dixon summarizes various phenomena and forms of doubles. (Dixon 2007). Thus, the "odd sense of the double" that *The Guardian* traced back to the spatial co-presence of actor and avatar in *The Tempest* (Billington 2016) echoes a whole variety of double concepts and even might have been influenced by the aforementioned temporal double phenomenon due to the latency of motion capture systems.

PRESENCE, ABSENCE AND BOTH AT THE SAME TIME

Presence and Absence is an artistic research project of the *Immersive Arts Space* at the Zurich University of the Arts that explored the phenomenon of double presence with virtual characters on stage and worked on playful solutions to overcome the scheme of doubleness without losing the transparency of liveness. The initial research interest arose from the earlier project *TwinLab,* a co-production with the experimental theater group Zuni Icosahedron in Hong Kong. In both locations the movements of dancers were simultaneously transferred to abstract 3D avatars by visual artist Tobias Gremmler and made visible in video projections.



PRESENCE AND ABSENCE: THE AVATARS APPEAR WHEN THE DANCERS ARE HIDDEN BEHIND THE STAGE ELEMENTS.

Despite the distance of more than 9000 kilometers, the performance could be followed by spectators in both cities. A fast data exchange enabled the virtual interaction of dancers and their avatars, simultaneously and at a distance.

With the *Twinlab* performance, the research team became aware of the dilemma of double presence. Visitors of the simultaneous performance described their experience of constantly having to decide whether to pay attention to the real actors or the virtual figures. After the debriefing session, Tobias Gremmler encouraged the research team to further explore the interaction between performers and their avatars in this respect. This resulted in the artistic research project, in which Gremmler's virtual characters from the *TwinLab* production served as a basis (Iseli 2021).

In close cooperation with Gremmler and the team, set designer Mariana Vieira Gruenig developed movable stage elements that allowed the dancers Aonghus Hode and Lucas del Rio Estevez, who were equipped with motion-capture suits, to disappear behind them while their avatars were projected onto the front of the elements. Conversely, the avatars were to disappear as soon as the dancers became visible. Technically, this is achieved with projection mapping, which is the expertise of engineer and artistic practitioner Martin Fröhlich, who developed open-source software for handling dynamic projection situations. The basis for this is a digital 3D model of the real space in which the projection takes place. All projection-relevant elements must be transferred to the virtual model true to scale, which is made possible with the dynamically captured position data of a motion capture system. This enables the software to precisely map the projected avatars onto the moving stage elements. As soon as a digital avatar moves over the edge of a projection surface, the projection switches to blank, so that only the real dancer becomes visible. Thus, the alternation of presence and absence results in a playful transparency. At the same time, it becomes apparent for the audience how the animation of the digital avatars comes about without being confronted with a rivalry for attention arising from the permanent double presence.

An important further feature of the stage elements is that the dancers can step through them. This is made possible by a surface that consist of elastic white ribbons strung together, instead of a solid screen. Thus, the dancers can push away the elastic white bands

with their bodies. They can also stick their heads, arms and legs through the flexible surface so that they appear only partially visible. And they can also simply jump through the wall of ribbons and thus quickly disappear or emerge.

The state of being both real and virtual at the same time, when the dancers remained partially visible, proved particularly fruitful in the exploratory approach. The spectators witnessed a character that appeared to be half avatar and half human, or that slowly passed from one state to the other. Finally, aesthetically, the rule that either only the dancers or their avatars should be present proved too rigid. By changing the software, this basic principle could be switched on and off during the performance. Alternating with the playful transformations, phases of simultaneous presence were introduced. This combination proved to be varied over a longer temporal distance and led to more dynamic sequences overall.

And what does all this have to do with artistic research? The project *Presence and Absence* consisted of experimental settings that produced explorative sequences with elements of the stage set, virtual characters, projection mapping and the dancers' play. Over several iterations, sequences were reset, discarded, adjusted, refined, and further developed. At first sight, this process seems indistinguishable from a standard rehearsal process. Typical elements of an artistic research scheme are a methodical approach that includes continuous reflection, a documentation of the process to ensure comprehensibility for outsiders as well as transferability, and an exchange with the peer community by means of publications and presentations. Throughout the process, guidance comes in the form of a precise initial question that makes reference to the state of the art. In this particular case it was, "How can the simultaneous stage presence of performers and avatars be transformed into a creative interplay of presence and absence but still guarantee a transparency of the process?"

The output of Presence and Absence is less a completed production but rather a set of prototypes. The primary goal is to enter into an exchange with the peer community of digital artists and the artistic research community by means of the publication of the results. Secondly, prototypical tools, ranging from open-source software to our newly acquired practical knowledge can be made available to artists in a variety of fields for further development.

TWINLAB: SIMULTANEOUS PERFORMANCE BETWEEN ZURICH AND HONG KONG.

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IN CONVERSATION WITH NEIL NEWBON

ANTON REY

ZURICH JANUARY 2020

Anton Rey: *Neil Newbon, you have worked in numerous countries all over the world. In August 2019, as part of our international conference to the research topic on our SNSF project "Actor & Avatar", you trained for the first time with Swiss, German and Austrian actors and actresses. Would you say there is a notable difference in approaching, sort of locally marked depending on acting traditions?*

Neil Newbon: I think that acting craft has been shaped in Europe both east/west and in the Mediterranean for so long that there is a commonality that runs through this part of the world. Acting techniques may different between Laban, Method, Misner etc etc but ultimately Europe has such a great rich history of writing, theatre, film and acting craft that European actors tend to feel similar to one another in these respects and by and large in their approaches to character. I think there are noticeable differences in approach when

NEIL NEWBON

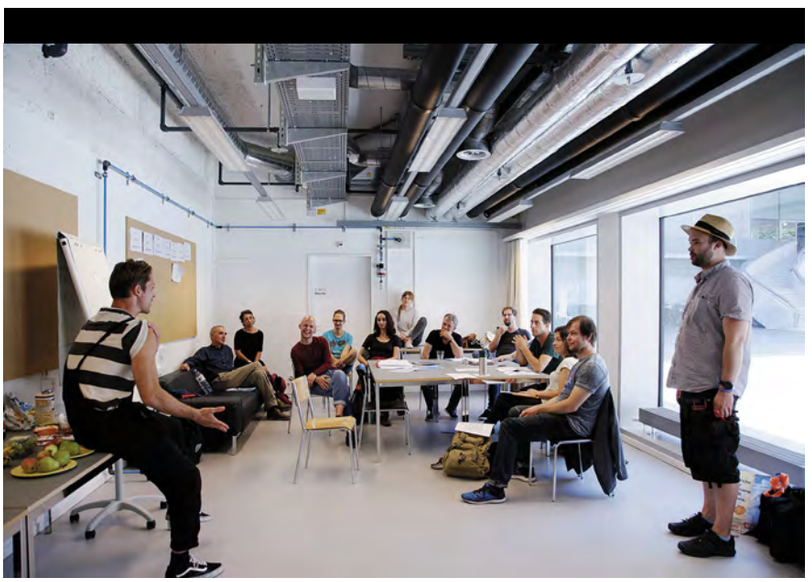
comparing say, Japanese actors or Indian actors to a German or a British actor, for example, due to different cultural influences and storytelling tastes than our particular continent did. Of course, it's worth saying, that at their hearts, all stories are universal and applicable to all Humans, even if their respective backgrounds, methodologies and palates differ in some respects.

A.R.: *What was the aim of the three days' workshop and how was it structured?*

N.N.: The aim of the course was to take the student performers abilities and knowledge—some from multi disciplines (dance, movement etc) as well as acting crafts, some whom had not a great deal of acting or performing beyond the theoretical and assimilate their various techniques into the givens of the "Volume", which is the name of the specific working environment of Motion Capture/Performance Capture, which are in turn referred to as Mocap/Pcap respectively for abbreviation.

The major difference between the two historically is that Motion Capture is focused on body movements and head only, with or without audio and is usually animation locomotion (in game movements of player characters and non-player characters) that are intractable by a game player, world-building background characters (ie, people at a football stadium or in the street), combat and stunts (games, films and actor doubling etc.) or performances by say dancers or gymnasts for multi-media use. Performance capture can include all of the above but also has face data and finger data and is also with or without audio being recorded.

As new technical narrative mediums, in the same way that theatre, TV and film are technical mediums in which to tell stories, the overall goal is to teach the students how the technical systems work, how these constraints can affect their performance, how to start thinking in different ways about creating character and implementing movements in the animation for use in Film, TV, Games and Interactive theater, how to be able to use this new discipline and to show what freedoms and restrictions to their performance the technical givens. We encourage the idea that this is a hybrid of theatre and film techniques as the virtual camera can be anywhere the actor is essentially "live" throughout the take and we train people to adopt a live performance unless they leave the Volume area, as their movement capture can be used and cannibalised into other moments and the system captures everything they do. In this regards the stage is always live and is similar to theatre that there is no dead space in the Volume for the actor.

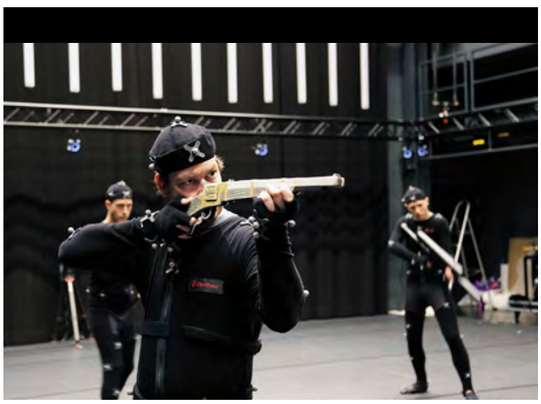


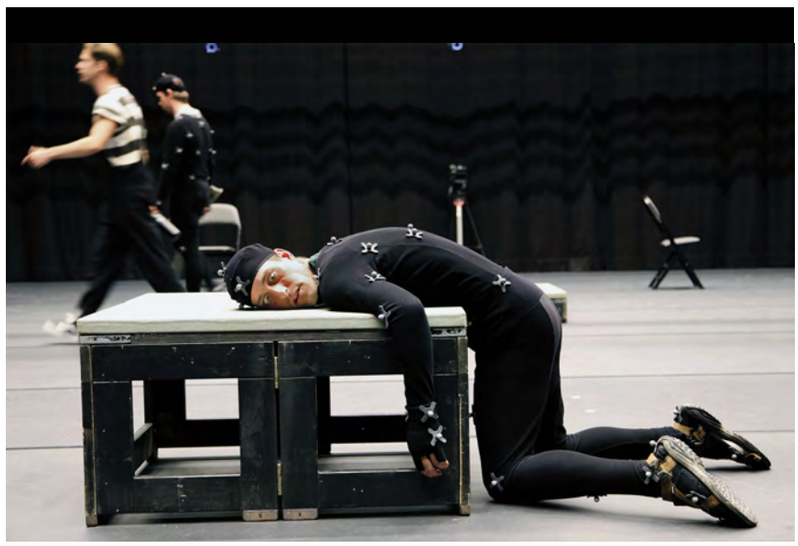
Alongside my co-founder, Saleta Losada Rodriguez, Performance Captured Academy's workshops are designed with a building block approach. We begin with an introduction to the technical aspects of the Studio using Industry specific jargon as it would be on a professional shoot, explaining how it works and how this may alter their performance.

We start in the suits, in the Volume and the nature of the workshop is predominately practical. We use a step-by-step approach—starting with natural basic walk cycles, observing the movements of a performer just as themselves, walking from one end the volume to the other to allow the performer to see character movement based on wants and needs and their habitual history to gain a fast insight into the need for total body involvement in this type of performance and how to start thinking of adjustments to create new and varied character archetypes. This continues with more complex movement-based exercises, adding animation character rigs working with different gaits, weight distributions and size changes—we then begin to add scene study and creature workshops to take the basic locomotion of Motion Capture to a

full acting performance (including vocalization) which we refer to as Performance Capture. The student in only 2 or 3 days is exposed to everything that is a-typical in our work in the Volume and in our experience, this is enough to get any performer from any discipline ready to work on a mocap or pcap shoot applying their craft to the level they possess.

A.R.: *While watching you work, I was reminded of games, but also of the silent movie era. The body language is emphasized and stands in the foreground; with the help of avatars one becomes aware of bodily expressions which on stage and screen, at least in the education, often stand in the background. During your training phenomena came to foreground which we would otherwise encounter e.g. with Commedia dell'Arte or as puppeteers. Do you see a direct link to these, silent movie era, CdA or puppeteer?*





N.N.: Indeed—we often refer to great movement artists of the silent film era such as, Buster Keaton or Charlie Chaplin. Who created great characters and complex sequences with nuance and empathy without the need for dialogue or sound. Infact the use of the speech cards in between shots could be taken out and the viewer would still understand the story and motivations of the piece.

Puppeteers often attend our courses and do very well, their understanding of crafting performances without relying on words to describe the inner thoughts or actions of a character does require a certain training and also a certain bravery in trusting themselves to be present to create authentic truthful movements whilst not relying on exposition etc. We often encourage students to seek out additional training in things like mask work, CdA, dance, yoga, method acting, laban, gymnastics for example. Anything that helps quieten the mind and get the actors into their bodies is relevant. A good command and control of one's instrument (an acting term referring to the actor as a whole) is applicable to this work. Film technique alone will sometimes leave a good actor stilted and wooden physically, whereas theater work doesn't always allow for minute moments that film often focuses on. As the cameras are theoretically operating in both a wide and a close-up simultaneously (a Schrodinger's cat effect as you don't necessarily know where the final camera position will be or if that shot will be altered or reused in another place or indeed in another character). Thus, these training examples are especially true for Mocap work where often a look or a body movement is all that is required to tell the story of the moment. In developing the ability to make specific physical choices without generalizing movement quickly when portraying multiple characters during a day's shooting (which is often the case in these types of jobs), the performer will always be able to stay authentic even when portraying minor background characters that serve mainly to add to the immersion of the viewer into a world.

A.R.: *How about the face when the body speaks aloud? The Hungarian film critic and theorist Béla Balázs spoke, when describing Asta Nielsen's acting, of a polyphonic facial expression becoming possible when opposing expressions appear in a physiognomy. In*

a physiognomic chord, as it were, a synthesis of the most diverse feelings, passions and thoughts appears—a synthesis that perfectly expresses the multifaceted human being. Much to my surprise, you were describing a comparable process when explaining how you acted in PLANET OF APES: LAST FRONTIER and described how the Gorilla had a real story, a character, you even called it a "personality"?

N.N.: As a physical performer I don't see a separation of character no matter the creature type, for story purposes most non-humanoid creatures are anthropomorphized to relate to the audience—so even if the face is not being captured it is connected, it is still a part of the performance as a whole. The character is still rounded and developed in a way to be able to play—animals in our own real world have personality and wants and needs—they are all alive.

I work using the idea of an actor's instrument as a whole, the actor should be focused on the character at all times and commit with their intuition and the design of the character 100% using the totality of their being. Unless there is a tonal/style constraint where the face/body cannot be allowed to move for whatever reason (such as the muscularity of the creature—as in the case of apes where they must smile in different ways to humans, or taking into consideration legs shape or arm length etc.) which is a design constraint the performer will have rehearsed and worked into their experience before capture, then it should be allowed to come in the moment naturally. This may take practice and experimentation, but ultimately should become habit for the performer to work as the character truthfully as you would do in any human role.

Obviously with dialogue this further alters this experience. I often design characters to have habits and quirks that I deem appropriate sometimes in the face—usually these represent to me something about the character but not usually explained to the audience—but they work with all the facets of character to create a deeper well rounded person, a more interesting imaginary being, the aim being to add layers to the story and the characters moving through it and immerse the viewer further in the fictitious truth of the piece, working with a creature is exactly the same process, they have needs, wants, habits and instincts just the same.

A.R.: *Are you consciously training and applying layers of mimic masks on top of each other, in order to evoke unsayable expressions which yet hopefully will be "read" by the audience? And if so, do you get information from the director or camera operator how close-up the picture will be, because this might make a difference on your acting scale?*

N.N.: Constant physical and craft training in new techniques and skills is essential for any Actor in any medium—it helps our instrument stay fresh, engaged and interested and allows us further range in our work and craft. I often seek out extra training that isn't directly applicable to a project I am working on in the present day but I know and have always found at some point will become relevant.

In terms of the picture, I touched on this above, we are sometimes aware of placement of camera, sometimes not. Actors in all mediums work closely with the guidance and voice of the director/directing team which may include lead animators as well. We also work in Mcap and Pcap, on the premise that each shot is a close up and a master wide at the same time—this allows us to be completely free in the Volume and ironically not worry so much about this. Marks and specific playing areas in terms of camera angles can come into play typically more in scene work and in fixed sequences, but in locomotion it is more often an abstract with no set environments necessarily and our own orientation in the Volume in relation to not specific camera shot singularly but simply to the floor (or z axis) is actually more important—as movements can be mirrored and manipulated in isolation by post processing anyway. I try to not get too caught up in whether "this is my close up" or not and will play each moment to it's fullest regardless of where I am told or believe the virtual camera will be.

ALL PICTURES FROM THE ZURICH WORKSHOP, ©IPF

A.R.: *Does face tracking make acting artificial, is it the glycerine of crying, helped acting, or does it, on the contrary, reveal layers we were not aware of before today's technical possibilities?*

N.N.: I think as the fidelity of the tracking, solving and rendering can now bring tremendous detail and nuance to a performance in animation, those of us that have been doing this work the longest have seen a wonderful transition from a heightened level of playing characters with exaggerated movements and a more "telegraphing" playing style leaning towards the theatric, to that of a more introspective nuanced filmic style of playing. These days we can see an eye twitch, well with a tear, the lips gently pucker revealing a subconscious thought etc. whereas that may have been lost in less detailed images say 20 years ago.

Further, I always play scenes with total commitment and regardless of whether tears, to use your example, can be added in afterwards to sell a moment, as indeed it is now possible to do so in film.

I think the best scenes work when you know the actor is 100% present in the characters truth with their impulses and choices working symbiotically regardless of the ability to track and change the face data, everything that is possible in film is also possible in Pcap too—you can add or take away anything on screen and editing has far greater scope as the images can be directly manipulated. For Performers we think of it more as "digital make-up" an expression coined by Andy Serkis', with whom I had the amazing opportunity to work with in the Apes franchise in 2015. I agree with him, it is a layer of makeup which can be manipulated but the layers of the character still come from the actor in their authenticity of the role and anyone watching the performance will be able to tell the difference in that respect.

A.R.: *Taiwanese/US American director Ang Lee (EAT DRINK MAN WOMAN, SENSE AND SENSIBILITY, CROUCHING TIGER, HIDDEN DRAGON, HULK, BROKEBACK MOUNTAIN, LIFE OF PI), three time Oscar winner and extremely experienced film director on diverse genres, also known for his careful, precise and effectful approach to actors, described the difference in acting after working on his latest motion picture GEMINI MAN:*[1]

1 Interview with Tobias Kniebe, *Süddeutsche Zeitung* Nr. 229, 4 October 2019

"What you feel inside is like a new world for directors. It will not be just the look that matters, the whole soul, the whole being will have an effect on you. That's what I think when things get easier with a little bit of digital help. That's where we going, we are going deeper in studying faces, we study people." *Would you agree that new technical possibilities reveal more than they hide?*

N.N.: Yes, I agree with this—those of us that started in Mcap and Pcap in the early days I think all knew this from doing the work, that this was the future, before indeed others in the industry gave this style of performance much weight or could see it as another valid art form narratively as well as visually.

In terms of the technical possibilities this evolution offers up, an actor can even collaborate with other performers to create an individual role—one artist to perform say the voice and face locomotion, one to provide movement in mocap, another one to provide stunts and combat, lastly one to perhaps be "skinned" digitally to use as the outside look of the character.

All these artists from different background shooting independently sometimes, can now work together for one character, each adding part of their artists soul to it, under the guidance of the director and animation team.

We can ultimately show anything of the character in digital world the only real limitation is the story and the imagination of the animators, actors, writers and directors. We can study character in the same way that film and theatre can and we can visually add and hide anything in the world/of the characters as we desire. Again, it is a choice as to what the vision of the piece and story needs. It is of course the same in live action film and in all mediums that use animation technology. With technical progress and evolution of fidelity, the depth of detail is greater and more manipulable.

A.R.: *Should actors be afraid their image will become a public playground?*

N.N.: This is a lecture in on itself. The answer is—maybe, maybe not. We get paid for our usage for each project (voice and/or skin and performance)—contracts are in place to ensure fair usage is agreed and unions and bodies are already taking steps to ensure regulation of this. Often it is just our movements that are being bought not our actual images, so it kind of depends. However there is a good record of companies being transparent about this so I'd say for professional actors you will always be told of what they are going to use your work and potential your image for and how. Even deceased artists have been licensed for their images through their estates and "brought back to life". Whether this is a good thing or not is really a matter for the audience I suppose and as long as there is a correct remuneration/protection of terms in the rights, I don't see much difference in what actors have been doing already for years in tv, film and adverts for example.

Ultimately when you sign the deal you are making a choice for yourself whether you are getting a good deal. Read the contracts, get advice, make up your own mind, know what you are agreeing to.

What is more troubling I feel is people's images being manipulated in the real world outside of entertainment such as pop stars and politicians etc. People that aren't in the public eye and can be scanned or photographed and used maliciously. This has and will cause much hardship and trouble and is becoming more and more sophisticated by those unscrupulous to do so.

A.R.: *Will some day the animator get the Oscar for performing a character which only ever existed as digitally mastered puppet, as an avatar?*

N.N.: I have no idea—I think animators currently receive Oscars for the project as a whole and as such that I feel would include "puppeteering characters" if it is solely digitally driven. However, if you are talking about puppeteering an avatar, which will be captured as a performance which would be done shot by shot in real-time, then that surely is an acting award and could be certainly credited as such.

FACING CHARACTERS. A VOLUMETRIC INTELLIGENCE FRAMEWORK

VICTOR PARDINHO, PIA TIKKA

In the enactive virtual reality installation *The State of Darkness* (Tikka et al. 2022) a participant is facing a strange prisoner Adam B. in a stressful interrogation situation without having any clue of what binds them two together. Distant sounds from the prison corridors frame their encounter inside the prison cell abstracted to darkness. The behaviour and facial responses of the virtual character are modified by the real-time feedback from the participant's psychophysiological data, however, in a way the participant has no control of. The experience builds up around the participant's efforts to try to read the facial expressions of Adam B. Is he someone to trust, or does his restless eye-gaze signal deceitfulness. Simulating any stressful human-human encounter, in the *State of Darkness,* the digitally constructed humanlike Adam B. behaves as having a mind of its own.

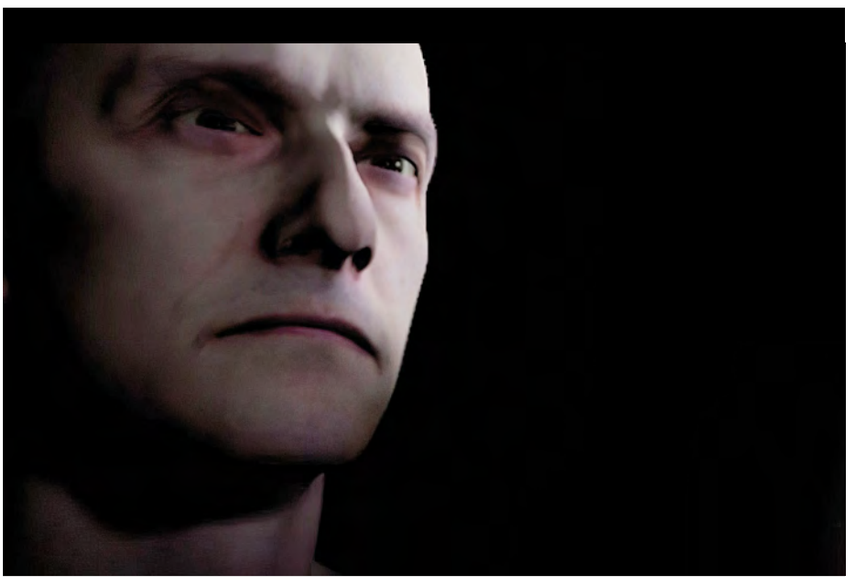


FIG. 1
STATE OF DARKNESS

The human-to-human encounters rely on the bodily gestures and verbal utterances of the interacting parties, but above all, they are guided by the facial non-verbal expressiveness of the two persons. The face is "constituted in as well as constitutive of social interaction" between two people (Haugh 2009: 11). In this paper we extrapolate the understanding of the dynamics of human face-to-face encounters in everyday world to the encounters between a human and an artificial character in virtual narrative context. We draw on Erving Goffman's seminal focus on the facial micro-movements and ritual expressions as those events

that determine the nature of the facial encounter during copresence (Goffman 1967: 1). The virtual character's face with its eye-gaze, head position and micro expressions are interpreted as one would interpret a human face in a similar social situation. This despite the fact that the artificial humane face is a digital machinery driven by a real-time adaptive intelligent system (AI), or perhaps by a more rigid, rule-based computer program.

In this paper the novel notion of *volumetric intelligence* (Pardinho 2019) refers to the technical constitution of a tridimensional machinery of a humanlike artificial face. The attribute of volumetric means something can be created or measured in terms of three dimensional space. Intelligence, in turn, is originally related to human cognition, today also related to the term "artificial intelligence" (AI), i.e. computerized intelligence that replicates or copies dynamics of human intelligence. In the current connection, the notion of volumetric intelligence suggests that an humanlike 3D-face can be harnessed with dynamical computer-generated behaviors so natural that the face may be interpreted to be a face of another human. This would be the case in the virtual reality installation the *State of Darkness.* A co-presence is constituted between the human and the artificial character that appears having a mind of its own (Tikka et al. 2020). The term co-presence refers to the sense of "being together" in a mediated environment (de Greef/Ijsselsteijn 2000; Ho et al. 1998), involving mutual awareness of the other (Heeter 1992). The way the humane character shows concern and feelings about what happens to the things and people around it makes us care about it (Bates 1994: 122). Similarly, as in real-life, or in movies, also in the encounters in the virtual worlds, the mind and mood of the people should reflect the dynamical changes of the world and people around them.

The following discussion is two-fold: First we describe the process of creating an artificial character Adam B. for our project *The State of Darkness* by means of low-cost photogrammetry techniques, digital software automation, and with a relatively minimal workload. The description will follow the method developed in Pardinho (2019). In the second section we describe making the character alive, as well as the design principles behind the facial interaction between the participant and the humanlike character Adam B. We conclude with the challenges related to facial inter-acting for and with the artificial character.

CREATING THE VIRTUAL CHARACTER

Since *Digital Emily,* the first humanlike avatar of a live actress, was introduced (Alexander et al. 2008), a range of methods have been developed for creating humanlike characters, including the pipelines presented at the *Actor and Avatar* conference, ZHdK, by Derek Bradley from Walt Disney Research Studio Zürich (https://studios.disneyresearch.com/digital-humans/) and Matthias Wittmann from Digital Domain (https://www.digitaldomain.com/digital-humans/). While characters developed by industrial studios highlight the possibilities of the photogrammetry technologies, more time and cost effective methods need to be created. The pipeline described here, is intended mainly for the use of individual media-artists and low-cost content developers, who need to have tools for fast proto-typing of characters for their projects.

The character creation starts from capturing an actor in a tridimensional space. By taking several photographs of the actor from different angles (preferably 360°), it's possible to calculate their position and unique shape in tridimensional space. This *photogrammetry* technique "encompasses methods of image measurement and interpretation in order to derive the shape and location of an object from one or more photographs of that object" (Luhmann et al. 2007: 2). The content generated with photogrammetry techniques allow multiple viewing points to the virtual character in tridimensional environments (e.g. Virtual

Reality, or Augmented Reality). When implemented in the virtual environment, the participant may walk around the character and even interact with the character in a relatively natural manner, if such an option is provided in the design of the experience.

The workflow for capturing an actor in a photogrammetry booth is quite different from capturing an actor's performance for a traditional movie scene. Instead of a moving performance, the actor takes one by one a set of key facial expressions and holds his face still while the synchronized multi-camera system simultaneously records each expression from multiple angles. A library of photographs of key expressions of a specific actor may be also acquired from commercial libraries. For instance, our character for the VR installation *State of Darkness,* depicted in the images of this article, was retrieved from http://www.triplegangers.com. Once the set of the live actor's expressions required for the specific project are completed, they are further processed by the photogrammetry software, which generates 3D models from the 2D images using a series of processes powered with computer vision algorithms. The four stages of the workflow are briefly discussed below. (For more details see Pardinho 2019.)

CAMERA ALIGNMENT

The first step in the post-processing workflow is the alignment of the camera position for each captured photograph. The software *Agisoft* searches for common features in each photograph and matches them pixel by pixel (Agisoft 2016). Using triangulation algorithms the software generates the probable position and orientation of the camera at the moment it took the picture (Warne 2015).

DENSE POINT CLOUD

After the algorithm has generated a sparse point cloud of the actor based on the photographs, it further generates what is called a *dense point cloud* (Fig. 2). This included depth maps of each photo. By analyzing the position of the photographs and the generated sparse point cloud data, the algorithm compares the RGB values, meaning the colour information, between the tridimensional points. By this comparison, it's now possible to generate a dense point cloud, a much larger collection of 3D points in the space representing the captured object. Together with the information from the last step, knowing the photographs position and the sparse point cloud data, it produces a much higher amount of small 3D points in the space with RGB values created by analyzing the colour data of the photos (Koutsoudis et al. 2014).

FIG. 2
DENSE POINT CLOUD

3D MESH GENERATION

With the dense point cloud generated, now containing also RGB values for each 3D point in space, a 3D mesh of our captured actor can be generated. At this stage, the software implements a Structure-From-Motion (SfM) and dense multi-view stereo-matching algorithms (Koutsoudis et al. 2014) to create a mesh triangulation. This enables generation of a 3D mesh, or 3D model, of the scanned actor.

3D MESH DECIMATION

One more crucial step has to be performed before the new 3D asset (Adam B., our digital 3D actor) can be exported. This process is *Mesh Decimation* (Kobbelt et al. 1998), which consists of decimating the numbers of polygons from a tridimensional mesh. This makes the object lighter and easier to manipulate, requiring also less computer processing power.

With the set of 3D models with different expressions, (Fig. 3) it is now possible to move the work totally inside a virtual tridimensional workspace in a real-time game-engine. When the character is inside a real-time engine, it can be prepared to perform facial expressions by morphing between the different facial expressions. At this point it's possible to connect the facial expression system to other real-time workflows, which will be discussed in the following chapters.

FIG. 3
3D READY ASSETS FROM DIFFERENT SCANNED FACIAL EXPRESSIONS.

GIVING THE CHARACTER A MIND

In this section we give an overview of the technical and artistic principles related to the facial interaction between the participant and the humanlike character Adam B. of the *State of Darkness.* The discussion is extended to future work in the field. The artificially intelligent systems based on Neural Networks and Machine Learning applications allow to drive the character's facial expressions in real time over the network in such a way that it seems alive. Furthermore, complex interactions between a human and virtual character can be created to the extent that the character generates new expressions based on the learned, *giving it an appearance of having a mind of its own.*

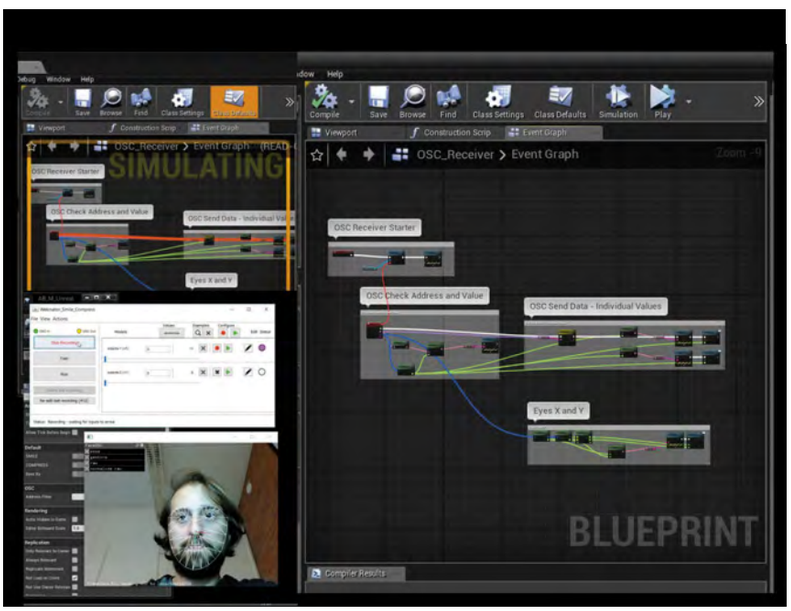


FIG. 4
OPEN SOUND CONTROL SYSTEM INSIDE UNREAL ENGINE ENVIRONMENT.

CONTROLLING CHARACTER'S FACIAL EXPRESSIONS

To control the facial expressions of the volumetric 3D replica of the actor in the Unreal Engine (UE), we used Open Sound Control (OSC) (Schmeder et al. 2009, 2010) and Unreal Engine's Blueprint programming system (plugin; Buisson 2014) (Fig. 4). The application FaceOSC (McDonald 2012) allowed us to match in real-time the facial feature data from the viewer's web-cam to the facial feature data of the 3D character in UE, modifying them accordingly.

In this process, we used Machine Learning software *Wekinator* (Fiebrink/Cook 2010) to train a range of 3D character's facial expressions based on the recorded data of human dynamical expressions. In case of neutral facial expressions, for example, Wekinator will gather samples of data values that represent a human neutral expression, producing an estimate of values that can be categorized as a neutral expression. Similarly,

recording smiling facial expressions, the accumulated sample data will be categorized to constitute this particular facial expression. By this training method, the application is capable of learning which range of data represents a neutral, smiling, and in principle, any other specific expression. Eventually, the virtual character's facial behaviour can be controlled according to the trained data from Wekinator. The application performs the character's facial expressions in real-time based on any actor's facial data recorded by the computer's webcam.

DESIGNING THE FACIAL INTERACTION

How the participant experiences the mood and mind of the virtual character is not only dependent on the facial or bodily expressions but also of the context within which the encounter takes place. In the VR installation *State of Darkness,* the participant's face-to-face meeting with Adam B. is contextualized within the frames of (i) the participant's prison-related imagery from lived experiences, media, news, books, films, and so on, and, (ii) Adam B.'s behavior. However, these two domains cannot be separated in the real-time recording of the participant's physiological responses, thus, in the following the recordings by the biodata are assumed to be influenced by both (i, ii). While the context-awareness cannot be emphasized enough, in this section, however, we focus on the creation of the facial expressions of an artificial character. The facial expressiveness of Adam B. includes two different layers: (iii) the pre-recorded *default* behavior based on the narrative context (without the participant's feedback) and (iv) the real-time *enactive* behavior (adaptive to the participant's feedback). (Fig. 5)

FIG. 5
PARTICIPANTS EXPERIENCING *THE STATE OF DARKNESS.*

For the *State of Darkness,* the default facial behavior (iii) was acted by a professional stage performer, who listened to the full soundtrack of the VR experience while simulating with facial expressions the imagined dynamical changes in Adam B's mindset. This professional acting-out the default states of the inner mind of Adam B. is considered crucial in the process. The facial motion capture software Face cap in iPhone (© Bannaflak) allowed to export recordings to FBX with mesh, blendshapes and animation data. The motion capture data was then implemented to the timeline of the facial feature data of the character in UE. The feedback from the psychophysiological recordings (iv) was conducted using commercially available biosensors. During the VR experience, the excitement and arousal of the participant triggered a direct response from Adam B. The stronger the emotion the participant was feeling, the stronger the emotional response of Adam B.

MEASURING PHYSIOLOGICAL SIGNALS

For the sake of installation practicalities in an open public space, we used the Empatica 4 wrist sensors, which provided relatively accurate measurements of the changes in heart rate (HR) and electrodermal activity (EDA). HR and EDA changes provide physiological quanta of arousal, aversion, and stress response. The EDA, or skin conductance, is a well-known indicator of arousal but is a very relative measure: levels of skin conductance vary between people and even same people can have different baseline level and range of activity between different recording times due to reasons such as how well the skin was cleaned and what is the temperature in the room. Therefore we needed to build a system that dynamically calibrates to the current level and range of each user. We did this by keeping a running window of recent skin conductance activity from which we constantly recalibrated the system to provide accurate feedback of the current changes in the user's level of arousal. Once the calibrated arousal levels were calculated, they were packaged into OSC (open sound control) protocol and sent over UDP network connection to the Unreal Engine.

CHALLENGES OF INTERPRETING FACIAL EXPRESSIONS

Considering the complexity of the setting, we assume that the same facial expression in two different moments during the interaction can be interpreted in very different ways, imagine flashing a smile when hearing a painful cry, or when responding to another person's smile. It thus follows that relying merely to simple basic emotion categorizations based on the facial features (e.g. FACS, Ekman and Rosenberg 1997) can be to some extent misleading, when interpreting the situatedness of the participant and/or the character Adam B. Thus, we prefer not to name the emotional states based on pre-categorizations but, instead, use references in terms of the temporally unfolding narrative, both as consequences of the past events and anticipations of the future events. The facial expressions generated by the unreal engine are constellations of multiple feature vectors (numerical data) each assigned with control over particular points in the character' face map and modifiable in real-time. Thus, the momentary expressions of Adam B. merge as a combination of the time locked default facial data (iii) and its dynamical modifications depending on the psychophysiological feedback data from the participant (iv). In the installation, the physiological data (iii) also affected the context, creating specific changes in the audio-visual prison environment.

CONCLUSION

The natural human face as the goal in creation of artificial characters, the live actors' professional expertise remains on the spotlight in the creative processes of each individual media work. An actor gives a character its unique personality, the individual ways the character expresses attention, intentions, motivation, care, love, and hate. Novel technologies, such as 360 degree volumetric video capture of actors in action, will give the actors even more freedom to act their characters in volumetric spaces, a topic of our future research. Whatever the chosen method, the challenges of creating and controlling humanlike characters expand from the technological to the psychological domains, far beyond the challenges of creating other animated entities, such as angry birds or speaking cars. This is due to the fact that humans are evolutionarily equipped to "read" friendliness or hostility in milliseconds from other people's faces or bodily movements. Such emotive-cognitive abilities are directly transferred to the performative settings, be those on the live stage or in audiovisual media, where actors enact human behaviors in different narrative contexts. The emphasis of context-aware reading and interpretation of the facial expressions multiply exponentially the complexity of executing control over the adaptive artificial character's behavior. The challenge is best handled by transferring the control of the facial behavior of artificial characters to the artificially intelligent systems. As this is an emerging and fast advancing field, we envision that the next edition of the *State of Darkness* may already introduce a fully independent Adam B., with a repertoire of emergent self-generated humane responses to challenge the participant facing him on the other side of the table.

ACKNOWLEDGMENTS:

We thank Dr. Ilkka Kosunen for insightful comments. The writing has been funded by Sense of Space Oy and EU Mobilitas Pluss Top Researcher Grant (MOBTT90), Estonian Research Council in association with Tallinn University.

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A NEW GEOMETRY OF THE EYE. THE CURIOUS CASE OF BRAD PITT

JÖRG STERNAGEL

What is the curious case of Brad Pitt? Does the curiosity come from watching and having watched the motion picture *The Curious Case of Benjamin Button,* directed by David Fincher, and starring Brad Pitt in the leading male role, back in 2008? What is the curious case of both the character Button and its actor Pitt? Might it be about face, or, to be more precise, about *vicissitudes* of the face, changes, processes, developments that are in the face, that are rendered visible on the face?

To begin, let us consider a review of the film, a review by Al Hoff, critic for the Pittsburgh City paper, who elaborates on his experience with the film, with the faces, with the vicissitudes of the face, with the curious case of Brad Pitt: "At the screening I attended, I could hear the audience snuffling, but I found David Fincher's overly long, glossy account of one man's odd life to be more emotionally distancing than engaging. Liberally adapted from F. Scott Fitzgerald's short story by Eric Roth (whose *Forrest Gump* this film reminds me of), the film tells the instructive tale of a baby named Benjamin Button, born old but who, as he grows up, becomes younger. Button is mostly played by Brad Pitt through the magic of make-up and digitally appending his head to tiny wrinkled bodies. In a series of episodes—intercut with an awkward dying-woman-recollects framing device—we follow Button from his childhood in a New Orleans old-folks home (how convenient), through World War II adventures and his mid-life romance with a ballet dancer (Cate Blanchett). While entertaining as a large-scale fable, *Button*'s story left many quirky details (a backward-running clock, a pygmy) unexplained, while blithely adding contrivances (Hurricane Katrina; a useful inheritance). Pitt is game (though you could feel the audience relax when he achieved his mid-life perfect Brad Pitt-ness, sunburnished and lounging in vintage khakis), but Blanchett seemed an awkward fit throughout. *Button* presents a mildly interesting idea juiced with a lot of greeting-card sentiment and golden light. Its point doesn't seem especially illuminating: We all age (or unage), and that process is rife with regrets and loss. But living life in reverse doesn't change the basic mechanics of the human condition, just as a clock that runs backward doesn't change the fact the time still moves forward." (Hoff 2009)

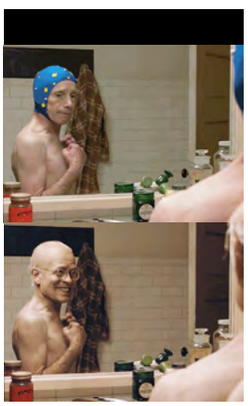
In the light of Fincher's film, what follows, let us consider three issues of Hoff's review, beginning at its end and ending up at its beginning: those will be discussions of, first, the Brad Pitt-ness he claims,

second, the magic of make-up and digital appendage he addresses, and, third, his own experience with the film that he describes as emotionally distanced. These three issues will subsequently be contextualized by brief paragraphs from F. Scott Fitzgerald's 1922 short story of the same name on which the film is loosely based and will be discussed within three paradigms of visibility, a model partly suggested by the sociologist Andrea Mubi Brighenti in his essay "Artveillance: At the Crossroads of Art and Surveillance" (2010). The first paradigm, dealing with the Brad Pitt-ness, will shortly be presented as the *visibility of the spectacle,* the second, on the make-up and the digital effects, also quite shortly as the *visibility of recognition,* and the third, starting with the reviewer's experience, more at length, as the *visibility of being.*

I. THE VISIBILITY OF THE SPECTACLE

> ***Benjamin, once he left the hospital, took life as he found it. Several small boys were brought to see him, and he spent a stiff-jointed afternoon trying to work up an interest in tops and marbles—he even managed, quite accidentally, to break a kitchen window with a stone from a sling shot, a feat which secretly delighted his father. Thereafter Benjamin contrived to break something every day, but he did these things only because they were expected of him, and because he was by nature obliging.*** *(Fitzgerald 2003: 67)*

Before the film, Brad Pitt, the actor, as we continue with the help of Fitzgerald, works up interests in the work, in his fellow-actors, in props and set designs, in the camera, to bring, at least in part, Benjamin Button to life. In sum, his interest, at least on an artistic level, would be to create a role. *Before the film,* we, in turn, work up an interest for Brad Pitt, as we have experienced him in numerous films before, as in *Seven* (David Fincher, 1995), *Seven Years in Tibet* (Jean-Jacques Annaud, 1997), and *Meet Joe Black* (Martin Brest, 1998) and therefore decide to be at the movies with him, to watch him in another film. In sum, our interest, on an experiential level, would be to meet again. *During the film,* Brad Pitt offers variations of his art, variations we are partly familiar with like the tone of his voice, his prononciation of words, his gestures, his posture, his obliging 'perfect Brad Pitt-ness'. Let us remember Al Hoff writing: "Pitt is game (though you could feel the audience relax when he achieved his mid-life perfect Brad Pitt-ness, sunburnished and lounging in vintage khakis)." Here, the focus is on the situation of perception during the film, a situation that is also influenced by experiences *before or after the film.* This is where a visibility of the spectacle develops, pointing successively lesser and lesser to Brad Pitt's familiar performing choices and my experience of them, but more and more to his star or celebrity functions.



Such a paradigm could be further scrutinized with Richard Dyer, for example, and his thoughts about the *Heavenly Bodies,* where the economic importance comes into play, and the star is also presented as being fashioned "out of the raw material of the person", where "make-up, coiffure, clothing, dieting and body-building can all make more or less of the body features they start with." (1986, 5) Or, as Brighenti points out, it could be interpreted with Guy Debord and his approach in the *Society of the Spectacle,* where we are separated from the celebrity or star in everyday life as the images we see with him, from him, are detached from life and only propose an illusionary form of life's unity, where Brad Pitt is "the spectacular representation of a living human being", embodying this banality

by embodying the image of a possible role." (1962: § 60) At this point, to move to the next paradigm, let us further reflect upon why the audience of Hoff's screening relaxed as soon as Brad Pitt achieved mid-life in his role in the film.

II. THE VISIBILITY OF RECOGNITION

> ***But one day a few weeks after his twelfth birthday, while looking in the mirror, Benjamin made, or thought he made, an astonishing discovery. Did his eyes deceive him, or had his hair turned in the dozen years of his life from white to iron-gray under its concealing dye? Was the network of wrinkles on his face becoming less pronounced? Was his skin healthier and firmer, with even a touch of ruddy winter color? He could not tell. He knew that he no longer stooped, and that his physical condition had improved since the early days of his life. 'Can it be–?' he thought to himself, or, rather, scarcely dared to think.*** *(Fitzgerald 2003: 68)*

Can it be, to continue with the film's very loose adaptation of Fitzgerald's prose, that the focus on Pitt and especially his face relies on patterns of recognition? Certainly, also this film in his making, to follow James Naremore in his study *Acting in the Cinema,* is dependent on "a form of communication whereby meanings are *acted out"* where, once it is released in cinema, my "experience of watching them involves not only a pleasure in storytelling but also a delight in bodies and expressive movement, an enjoyment of familiar performing skills, and an interest in players as 'real persons'." (1988, 2) Here, the paradigm of the spectacle shifts to the paradigm of recognition as "the interest in players as 'real persons'" remains influential, while the "delight in bodies and expressive movement" become central. Here, the film's decision is to offer a basis for orientation from which a "delight in bodies and expressive movement" can develop. This basis, this center is the face of Brad Pitt, with all its features, its eyes, ears, nose, mouth, hair, even its "network of wrinkles". Throughout the film, Pitt occassionally appears as himself with his own acting body and enters with his own face and his well-known expressions, but, more often than not, his body in general and his face in particular solely function as sources of inspiration and contact: Pitt's face is partly attached to other actors' bodies, acting out either familiar or different meanings, while being always ready for the close-up, while being successively experienced as aging backwards. "Button is mostly played by Brad Pitt through the magic of make-up and digitally appending his head to tiny wrinkled bodies". (Hoff 2009) Pitt's moving, constantly altered face frequently appears at the center of attention and offers both an orientation and a dis-orientation, along with an ever-changing body that does not always belong to Pitt himself. Here too, "something sharper than a mask is looming", "something sharper" that Roland Barthes sees in the face of actress Greta Garbo, »a kind of voluntary and therefore human relation between the curve of the nostrils and the arch of the eyebrows; a rare, individual function relating two regions of the face." (2004: 721) However, in Pitt's face, this "human relation" is re-considered and re-structured in digital codes, inviting us to reflect upon a very slippery realm of film experience, where unresolved affects might prevail, partly created by, and this is where the first part of the essay's title comes from, "a new geometry" of the face, its rendering, especially in detail of the eye, of its "eye socket structure", as one of the visual artists of the motion picture, Edson Williams, points out, for "the effect of age re-juvenation". The techniques in question are correspondingly named in a meaningful way: "Emotion" and "Facts", facial coding systems, enabling animators to use micro-expressions to manipulate individual movements such as a dimple or eyebrow twitch, taken from Pitt's own face, aiming to keep Pitt's/Button's expressions true to the performances through the ages and on to the bodies, in order to keep the possibility of recognition for the spectators.

III. THE VISIBILITY OF BEING

> *Up in his room he saw his reflection in the familiar mirror—he went closer and examined his own face with anxiety, comparing it after a moment with a photograph of himself in uniform taken just before the war. 'Good Lord!' he said aloud. The process was continuing. There was no doubt of it—he looked now like a man of thirty. Instead of being delighted, he was uneasy—he was growing younger. He had hitherto hoped that once he reached a bodily age equivalent to his age in years, the grotesque phenomenon which had marked his birth would cease to function. He shuddered. His destiny seemed to him awful, incredible.* (Fitzgerald 2003: 76)

Indeed, there is a process of continuing, of establishing the phenomenon of *aging* backwards, prominently through and with the face of Pitt, with an attention to detail carrying affects that initiate experiences of belonging and non-belonging in human and non-human interrelation: But, here, too, "instead of being delighted", as Fitzgerald proposes considering his protagonist looking in the mirror, seeing himself getting younger, for me, too, there is an uneasiness, as is for Hoff: "I found David Fincher's overly long, glossy account of one man's odd life to be more emotionally distancing than engaging." (2009) The grotesque phenomenon of aging backwards that Fitzgerald writes about in his short story is sought to bring to the screen and there, too, it shows, even if at least in part in an unforeseen way: the bodily uneasiness with and the emotional distance from what is rendered visible on screen are centered on and around Brad Pitt's fragmentized body, following his remaining bodily traces in a very slippery realm of film experience, where unresolved affects might prevail, as especially the partly animated face of Pitt develops to be ungripping, causing uncertainties of how to act within the visual, auditory, and tactile field between the screen, Brad Pitt, his digital fragments, Al Hoff, and me, for example. Here, the coexistence with the film actor is challenged, and the bodily link to the actor is loosened. The form which is common to both the actor's and the spectator's visual and tactile perceptions occassionally dissolves, the form that both actor and spectator possess, where, according to Maurice Merleau-Ponty, "all happens as if the intuitions and motor performances of the other are founded in a kind of internal encroachment, as if my body and the other's form a system." (2010: 452) The form is my body, and what I learn to consider as the other's body is a possibility of movements for me; thus, Merleau-Ponty: "We can say that the actor's art is only a deepening of an art that we all possess." (Ibid.: 453) This possibility is partly vanishing in the face of Pitt and his others, on the various bodies, despite the attention to detail and the use of his own voice. The visibility of *being* turns to *non-being*, and provokes concluding remarks on a phenomenology of the face: Details of the face are preceded by physiognomies in which moments of facial expressions, gazes, and liveliness abruptly emerge. These moments are not registered as empirical data to assemble, or to compose a face, moreover, these moments are seen as primarily forces and affects, and we see less a geometrical form than a pure and moving expression. While the making of Benjamin Button with the help of the Brad Pittness certainly adds to this human experience of the face, it also certainly lacks an important ingredient in its rendering: a *somehow* pure and moving expression, leading to a slippery realm of film experience.

"Through the noons and nights he breathed and over him there were soft mumblings and murmurings that he scarcely heard, and faintly differentiated smells, and light and darkness. Then it was all dark, and his white crib and the dim faces that moved above him, and the warm sweet aroma of the milk, faded out altogether from his mind." (Fitzgerald 2003: 83)

At the end of the film, the dim, indistinct, unclear faces of Brad Pitt fade out altogether from my mind and body, and, unfortunately, not even "the warm sweet aroma of milk" remains and I am still kept at a safe distance.

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ON ALI MOINI'S AVATAR HACKING[1]

ALEXANDER GERNER

> *"The project is a platform where through a 100% mechanical pulley system, a human size marionette and me/performer have the possibility to interact. The machine works as a transmitter/translator of movement, with which I will work on demands, agreements, affection, intersections, differences, transportation, hybridization, accompaniment, anger, violence, manipulation… between me and a double of me."*
>
> *Ali Moini, FIMFA (2018)*

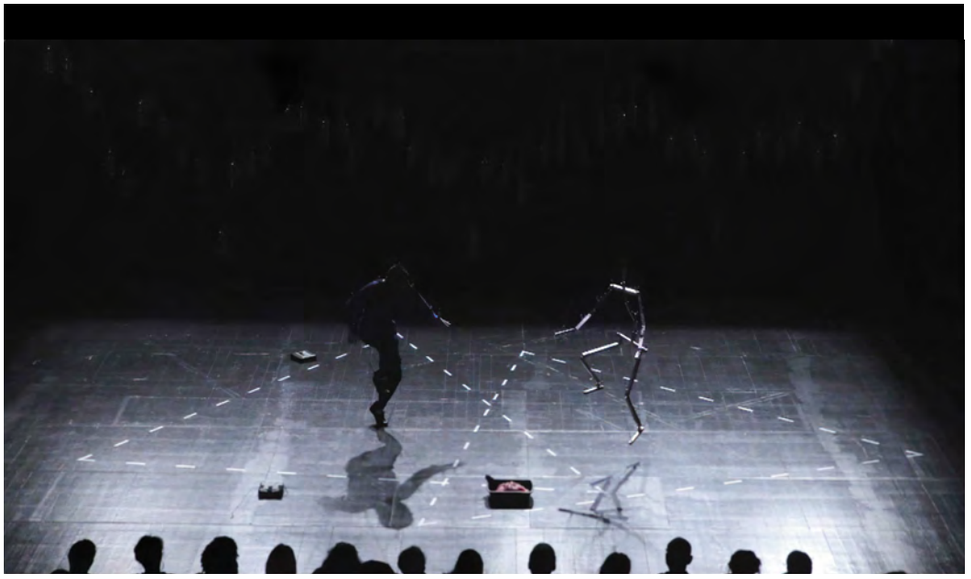

IMAGE 1.
VIDEO STILL: ALI MOINI "MAN ANAM KE ROSTAM BOVAD PAHLAVAN"
LISBON FESTIVAL OF MARIONETTES AND ANIMATED FORMS FIMFA LX18, MAY 15–16, 2018, TEATRO MARIA MATOS (HERE MAY 15, 2018).

1. "MAN ANAM KE ROSTAM BOVAD PAHLAVAN": ON THE MOVEMENT OF USURPATION/POSSESSION

A complex and precise human–artifact relationship questioning the creator and its avatar is enacted in Ali Moini's unique performance that I assisted in May 2018 in Lisbon at the FIMFA international puppet theater festival. Moini provokes a transformation of the digital proxies, doubles, or playable characters such as avatars and electronic placeholders that have become ubiquitous. The dramaturgic strategy of mutual transformation of human into machine — *cyberization* — and machine into human — *anthropomorphism* — is reflected in Moini's performance entitled "Man anam ke Rostam bovad pahlavan." The mysterious

1 This research is financed by Portuguese national funds through FCT—Fundação para a Ciência e a Tecnologia, I.P., within the scope of the Transitional Standard—DL57/2016/CP CT[12343/2018], in the scientific field of History and Philosophy of Science and Technology, Project: *Hacking Humans. Dramaturgies and Technologies of Becoming Other.* Position: 2404.

and strange Persian title of the performance is derived from an Iranian/Persian proverb, of one of its most important cultural figures—*Rostam*—a generous, genius, powerful character of the Persian pre-Islamic myth of the Epic of Kings. In this Persian myth—the only one that has been entirely transmitted, fixed in writing by Ferdowsi in the 10th century as "Shah-Nameh"—Rostam kills hundreds of giants and demons. Whoever utters the proverb proposes a manipulative rhetorical act related to a—I would not say false, but—*plagiary inheritance* of equality of fame and power with Rostam. A possible translation that Moini proposes would be: "I am the one, though/since Rostam is and will be the ultimate champion" (Moini, December 7, 2020, personal communication).

According to Moini, the utterer of the proverb hopes that the listener will not find out about the cheat because of the confusion created. Thus, in the words of Ali Moini, "the proverb is simply a bluff, but as it's playing with misunderstanding and misleading through linguistic games, it's not an obvious bluff!" (Moini, December 7, 2020, personal communication).

Let us go beyond the language game of cheating and manipulation and ask of Moini's performance: What if the unreal and manipulation are taking over our reality, including not only words and actions but the entire physical and fully embodied world, including its actions, actors' roles, and personae?

2. BEYOND AVATAR DREAMS AND AVATARISM

Moini focuses on the re-materialization of direct body-force manipulation in which the approaches of machine readability and digital motion capture tools (Delbridge 2015; Karreman 2017) are called into question. Moini does not adhere to chimera-identity effects of anticipated imaginations of programmed movements within the cultural *avatar dream* (Fox

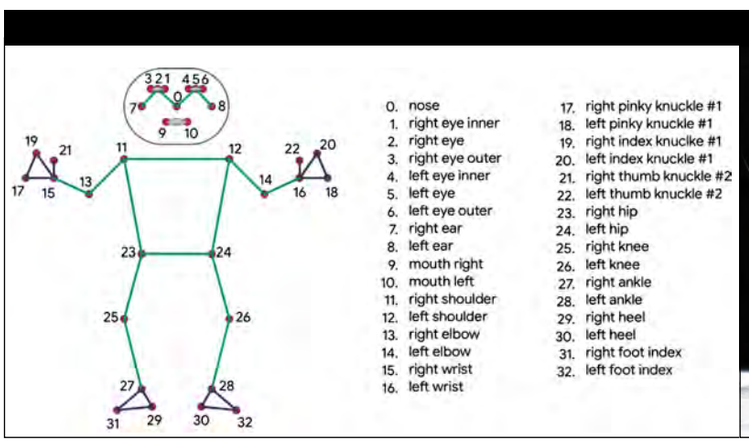

IMAGE 2.

VALENTIN BAZAREVSKY AND IVAN GRISHCHENKO, RESEARCH ENGINEERS, GOOGLE RESEARCH (AUGUST 13, 2020), *ON-DEVICE, REAL-TIME BODY POSE TRACKING WITH MEDIAPIPE BLAZEPOSE*

GOOGLE AI BLOG: RETRIEVED ONLINE SCREENSHOT FROM HTTPS://AI.GOOGLEBLOG.COM/2020/08/ON-DEVICE-REAL-TIME-BODY-POSE-TRACKING.HTML

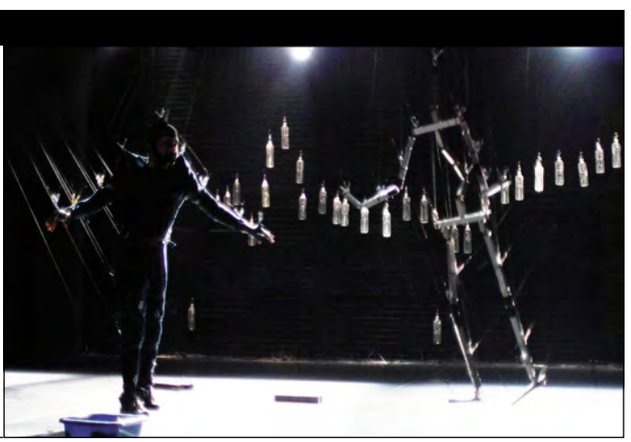

IMAGE 3.

MOINI AND HIS AVATAR PLAYING WITH THE T-POSE.

PHOTO TAKEN FROM "MAN ANAM KE ROSTAM BOVAD PAHLAVAN," PHOTO: YANN GIBERT, 2018

Harrell & Lim 2017). Moini's performance critically and forcefully reflects his bodily resistance to future artistic visions such as virtual identity surrogates or avatar dreams. Moini does not follow motion-capture performance aesthetics; instead, he critically plays with the zero point or pole position of such endeavors, such as in the *T-pose,* the default shape of the humanoid game models used to calibrate and initiate motion capture and rendering. The T-pose is essential as a placeholder for animations (or imaginations) not yet completed. However, in a repeated sequence at the beginning, the performer slips out of these motion-capture poses—and so does his double on stage after a short delay—as if incapable of being captured, as a glitch in a material system of motion and movement appropriation. The aesthetics of the avatar pushes us into a post-digital age in which we can track movements and create movement skeletons, such as with the digital movement program *Kinect,* with body or face-tracking applications, and then apply an *"avateering"* software such as *Vitruvius* that enables control of any humanoid 3D model, in which not only is motion captured in dance and gesture research, but computer-aided anthropomorphic agents become part of performances.

Nowadays we enter fields of high-tech robotics: dance is co-opted as a slave movement to transpose a movement pattern from one performer to many others, scrapping human uniqueness for the posthuman "singularity" (Kurzweil 2005). In a recent research paper titled "Everybody dance now," Chan et al. (2019) put forward the idea that we can usurp the dance movement of another dancer/mover, called the *source,* by transferring body movements via algorithms to video image footage of someone else, the *target,* as an elaborate uncanny ghosting movement in *AI puppeteering.* The principle, in this case, is a real-time target matching and a "do as I do" motion retargeting that makes "everybody" (including several virtually re-embodied targets) "dance" in the same way as the source movement. This mechanism should be critically considered a human-mimetic artificially-embodied AI in which dance movement is recorded from one person and transferred in a usurpation of the other's strength, a non-synchronized feedback loop reapplied to a targeted dancer.

This concept of source/target doppelgängers, the limited imitative sameness of mirror-image avatars or digitally and mechanically reproduced puppets (Wolfson 2018), is in steep contrast to Moini's live performance, which no longer fits into digital doubling motion capture tools of digital avatar corpses that have to be animated by the dance moves of others. The uncanny ludic play between "death" and "life" is controlled by the equilibrium between tension and counter-tension.

The game is to play with the other's counterweight resistance and the limits in its choreographies of movement to avoid crashing in the danger zone between freedom and necessary constraints (Serres 1995: 106–107). Only in the end is the tension of the steel cables released, and with rapid moments, the steel cables spring into the air, and the avatar form collapses into disorder. If the avatar performance system of Moini is a defense of liberal *avatarism* (Fodor 2021), freedom of form and the transmitted, animated, or expressed self-image are called into question as the avatar is finally suspended in the air, unbound, and the performer freed not from becoming an avatar, but from his double.

An avatar without a head or eye gaze, such as Moini's or the chimeras of actors/masks without gaze, renders visible the absence of a living human body, in which a human visage (Artaud 1947)/human voice is missing. This absence of the human echoes as well in the work of the contemporary artist and theater-maker Susanne Kennedy and her posthuman avatars on stage: "I see a theatre where the voice no longer belongs to the body, the face is no longer the conveyor of emotion (…). In the end, the actor becomes imperceptible" (Susanne Kennedy cited in Trueman 2018). Moreover, Susanne Kennedy declares, "I see a theatre where the protagonist no longer exists and the stage where he used to stand in the center of it all, is filled with other beings—human and non-human. They speak with voices and faces that are not their own. They communicate in languages we have yet to learn" (Kennedy 2015). Moini's performance resonates with Susanne Kennedy's vision of a post-digital avatar theater, although the two take contrasting approaches to its aesthetic realization.

In the fields of performative arts such as dance and theater, as well as in cinema, the avatar becomes different to a mere playable gaming character. Thus, we can ask what the *lived bodies in time* factor tells us about the differences between theater, cinema, and dance and the missing avatar gaze in Moini: Is it true that cinematic "events" in the sense of transitionless transitions — or theater, and I include dance — as "reactions to events" (Eisenstein 1949: 6), by which the possibility of the other and its gravitas of a persona on stage or screen are given in the first place, are rendered impossible or diminished by the introduction of repetitive avatar play?

Florian Malzacher's vision of contemporary political theater, *Gesellschaftsspiele* (2020), shows how avatars as digital and perfect representations are re-embodied on stage imperfectly and gain human actors' flaws. Two examples he gives are the android double of the actor Thomas Melle in *Uncanny Valley* (2018) and Susanne Kennedy's *Coming Society* (2019), as well as other works by the same artist, in which actors play with avatar-masks of their own faces, thus emphasizing the singularity of the event of acting live on stage and the importance of live characters being unable to repeat hand movements, swallow, tremble, breathe, and sweat despite its repetitive Avatar game:

IMAGE 4.

THE SCULPTURE AND SCENIC INSTALLATION OF MANNEQUIN-CORPSES ON STAGE AS AVATARS AND SYMBOLS OF YOUNGER SELVES OF THE ACTORS IN KANTOR'S *"UMARŁA KLASA"* THEATER OF THE DEAD.

PHOTO: ADRIAN GRYCUK - EIGENES WERK, CC BY-SA 3.0 PL, HTTPS://COMMONS.WIKIMEDIA.ORG/W/INDEX.PHP?CURID=24274872

IMAGE 5.

VIDEO STILL SCREENSHOT FROM THE FILM ADAPTATION: TADEUSZ KANTOR *"UMARŁA KLASA"* (DEAD CLASS)

YOUTUBE HTTPS://WWW.YOUTUBE.COM/WATCH?V=A235HHGFIPS (05.05.2021)

The perspective of theater is not one from the future, but one directed toward the future. A world in which humanity has dissolved into nature, technology, or data, theater cannot represent, cannot depict. But it can represent the rapid changes from a human perspective and explore scope for action.

> ***"Susanne Kennedy stages a similar game under reversed conditions in Coming Society (2019), when she has avatars—inadequately—represented by humans. Their trembling, their rapid breathing, their sweat are the connecting channel to the audience. Just as little as the Melle-bot can dance, so little can Kennedy's performers embody themselves in a way that would be appropriate for virtual figures."***
> *(Malzacher 2019: 46, my translation)*

With avatars that function as *playable characters* we are not so much concentrated on their gaze, but more on what we can do with them as an *action* play and how we influence the avatar's movement as a complete character. Humans have gravitas when they mimic and play: What does it mean to be human? What is this *ritual* of *doing* and *enacting* theater to mimic and play a character in film? It is about a live ritual for the still alive but coming dead, about the process of dying—or about playing with the "dead class" puppets or avatars of younger pupil selves as a preparation for our loneliness of memorizing the past and our self-doubles over time, such as in Tadeusz Kantor's *The Dead Class* (1975). The death mask and photography have in common that they are both relics of the past of a person or a moment of time gone, but preserved to see and touch.

3. THE ART OF HACKING THE DIGITAL BY PHYSICAL AVATAR HACKING

We can describe the challenging movement game of Ali Moini's performance, which includes the realization of a metal-rod avatar as a reflexive and reactive double of the performer on stage, as a play between vectors of force and embodied rehearsals of systematic resistance to scalar cultural games of mere synthetic simulation and recursivity of actions (e.g., digitized kinetic avatars). The mechanic details that Moini hacks into show strong resistance to pressure and require a *"vectorialist"* position of attention on the part of both the performer on stage and the audience that partakes. In the words of Yves Citton:

> *"(...) we should not lose sight of the fact that attention itself is a vector, pressure, orientation, "direction of effort",* Zuwendung, *(...) The vectorialist class is not exploitative because of its "power to move anything and everything", but because of its requirement that "value be realized" in countable terms. Such is THE TRUE CHALLENGE OF DIGITAL CULTURES now emerging:* how can you take advantage of the vectorial power of the digital without allowing yourself to be imprisoned in the scalar cages of digitization? *Only the art of interference, the elusive strength of hackers, can rise to such a challenge—which is at the heart of the attention ecology in the age of its electrification."* (Citton 2017: 78)

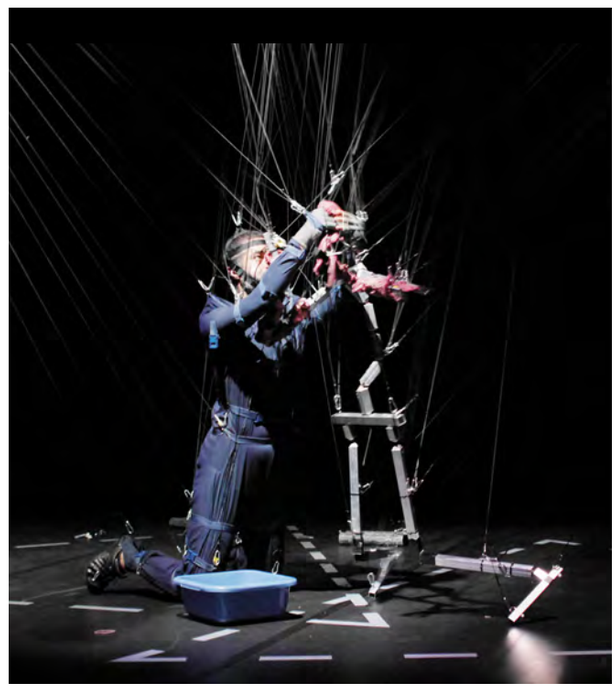

IMAGE 6.
ALI MOINI "MAN ANAM KE ROSTAM BOVAD PAHLAVAN": MOINI HACKING INTO HIS AVATAR MOVEMENT PUPPET PHOTO: YANN GIBERT, 2018

Moini does not define himself as a mere dancer nor as a hacker. I would nevertheless call him a deep cultural hacker—taking advantage of vectorial and material-embodied aesthetic thinking and mechanical movement, power, and strength while interfering in existing patterns of artistic gestures to rebuild systems of acting, involvement, and play within encounters of alterity to install proper performative degrees and qualities of freedom. In this description, Moini's avatar double performance shows movements of resisting and gestures of avatar hacking. By contrasting constellations between the mediating body gestures of the performer and the effected action in the steel puppet we can speak of double movement gestures, which have the peculiarity of showing that they show themselves (cf. Mersch 2014)

in this doubling effect in the sense of a direct reflection on stage: "a double perception because it also makes something perceptible, just as it exhibits the perception of this perception, the showing of self-showing, as it were" (Mersch 2019: 219).

Moini does not see the human body as what lies at the core of his choreographic activities, but in his performances he places the human body in a larger context, such as in his architectonic mechanical bond/avatar installation, in which the articulations, the bonds, the counterweights, the strengths, and the pressures weigh as equally essential measures.

Moini has more than only his skin in the game. However, his avatar system mediates his fully fleshed out, embodied world with movement—that no disembodied global data nets, despite any quantitative total availability of digital avatars, could ever offer us. The question is: Has the avatar in Moini's performance become a representative of a symbolic order in its place that mediates the symbolic *other* that locates it in playful tension? Is this avatar a sovereign or a ghost of a digital order that becomes an "other" in the material world? Does the avatar gameplay lead to confusion and the abolition of differences so that the symbolic order of difference between the living and the non-animate becomes endangered? Or, as it seems, does the idea of the avatar itself become hacked and questioned?

Via a system of strings, pulleys, and counterweights, Moini puppeteers his full-body movements and gestures. After the show *My Paradoxical Knives,* in which Moini was connected with knives and tapes and wore elastics and magnets, he deepened his performative research on human motion in the show "Lives." In the current show, in joining a metal self-duplicating marionette, the performer requires a third or parasitic noise (cf. Serres 2007) to provide counterbalance. This equilibrium tension between human and mechanical entity is provided by bottled water as a third balancing weight, which mediates. What mediates is the *weight of water.* Water is the most valuable material of life on planet earth. Water is the most critical resource for human beings, from which our bodies benefit and regenerate. This is a real-life reference to the ecological, nature-life-artifact balance, based on the weight of water, a substance which is under threat and has begun to be treated as a tradable commodity or an asset in the markets of the world economy.

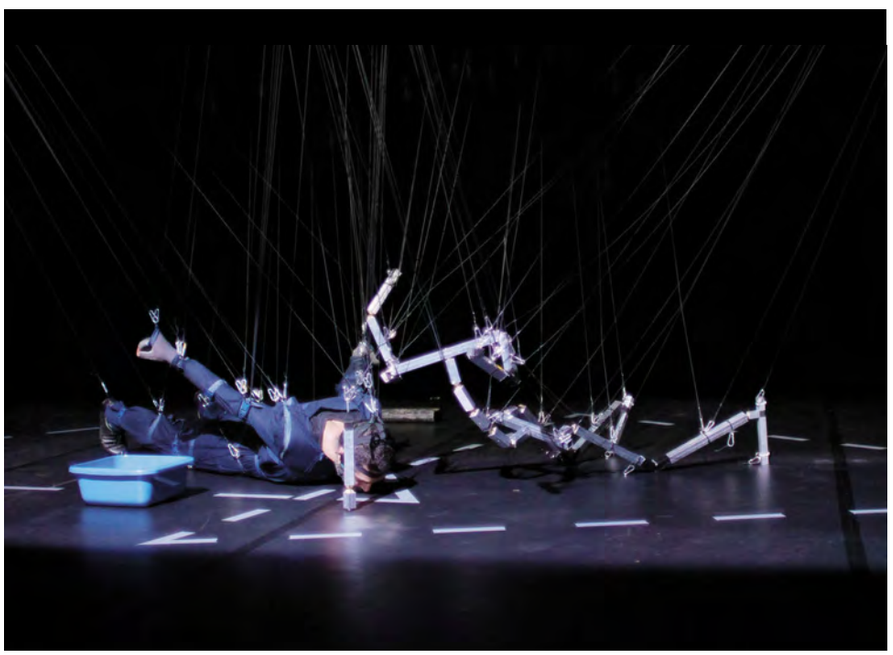

IMAGE 7.
ALI MOINI AND HIS AVATAR SLIDE TO THE SURFACE OF THE STAGE. PHOTO TAKEN FROM "MAN ANAM KE ROSTAM BOVAD PAHLAVAN."
PHOTO: YANN GIBERT, 2018

In his performative work of art, Ali Moini deepens artistic research on human movement, exploring the possibilities of a human-machine and its other, by regenerate creating a diagrammatic self: water in bottles as balancing counterweights and as a symbol for the carrying capacity that sustains the fragility of human life's material-biological necessities. His choreographic play encompasses almost all of Roger Caillois's (2001) categories of play, localized between mechanic gamification, *paidia,* and *ludus* play, between vertigo and mimetic mask. regenerate Moini's performance also engages with agonic occurrences in movement-hunts between the actor and avatar, with whirling, swinging, and spinning vertigo (another category of play, *ilinx).* This movement doubling leads to a transformative mimetic of fleshing out the avatar in this phase of the performance, where Moini as performer in the encounter dresses the avatar marionette with raw meat, and finally restructures the avatar wiring. The mimetic game of the double becomes less imitative but even more uncanny.

Nevertheless, despite the variety of play, no aleatoric moments are shown. In contrast with unthinking chance, Moini's movements need to be precise to avoid his being harmed by the metal avatar.

In Ali Moini's performance, the avatar play shows us the danger of our unconscious attitude towards movement mechanization and the algorithmic doubling of ourselves. Moini confronts us with the threat of handing over ourselves to the algorithmic rationality of the posthuman via contemporary avatars.

4. ACTOR & FULL-BODY MARIONETTE: A STEEL-CABLE BOUND CONTRACT SYSTEM

The movements of the human dancer and the avatar are performed on a threefold diagrammatically drawn and circumscribed performance field of dotted white lines on the surface of the stage — 1) a human performer zone 2) an area for the artifact/puppet, and 3) an overlapping zone of human performer-artifact encounter — indicating the attached bonds of the relation between the lifeless marionette and the entire body puppeteer as a comprehensive acting object (Lucie 2020), or the quasi-object bonds of the in-between of weights and movements connecting the two entities. These spatial designations include, to an even more significant degree, a 3-D dimension of pulleys, 2000 meters of wires, carabiners, and 45 water bottles stretched on fine steel cables — revealing the potential of the human-machine hybrid that is never wholly balanced but is almost always under the tension of its cords.

IMAGE 8.
ALI MOINI "MAN ANAM KE ROSTAM BOVAD PAHLAVAN"
PHOTO: YANN GIBERT

This provides us with a performative thinking similar to what Michel Serres in *The Natural Contract* (1995) describes as a materialized — pre-language — *contract*. In this contract, a complex system of pulleys and cords between technology, human action, and artifact shows us a state between bondage, constraints, and degrees of freedom of movement — in the case of Moini with his action double, thus a contract with his movement avatar beyond any fictitious bluff: What kind of contract do we as spectators observe in Ali Moini's performance of strings and bonds of mechanical movement transmission? Moini extends his reach by use of the avatar bonds, the sturdy and thin steel cables, via the carabiners, that bind him to his marionette double, the movement avatar. Together, they choreograph a de-phased double radius of freedom for a human performer and physical double to move and act in a finite playing field, but movements always occur with a temporal delay, during which Moini struggles against

the resistance of the entire system of bodyweights binding him. We hear the strings and the pulleys work together with the two bodies' weight in the performance production process. Because the mechanical pulley block consists of rollers (fixed or loose) and rope or metal strings, if you lift the body load with the help of the pulley block, the avatar body's burden (=the weight of the load) is distributed evenly over all load-bearing ropes.

5. DEEP PLAY WITH THE OTHER

After displaying the performer's body clinging to the strings, the performance enters the approximation phase between the interlinked performer and his avatar. This phase of approximation, with slower and more careful movements, follows a stage of a rapid chasing that transforms the fight for a state similar to the sense of "animal mirrors" (Geertz 2006: 433) of live avatar fights used in "surrogate" (Geertz 2006: 436) cultural and social struggles for superiority. In contrast to avatars fighting animals, the danger and vulnerability fall entirely onto the performer Moini, who has to avoid a bloody crashing into his interlinked metal rod avatar in the serious theater game on stage. In another phase, besides leaning forward, a stasis-like movement of lying horizontally back in space is observable.

This moment is not a movement of gliding to the floor as a slip and error of an initial apprenticeship through failure: an intentional failing in the attempt to move, an intentional falling—as Laurie Anderson[2] explained it—as a chance to catch yourself from falling, falling as a chance for a new step, a beginning, childlike, slipping to the ground and getting up into a position between upright and floating. I saw Moini as a performer intentionally falling, failing better, and by that underlining what it is to be human on stage. The slipping from the upright position to the stage is performed as a kinesthetic dance that has turned from the attitude of a spectator of surrogates to becoming a co-dependent system with its avatar.

Instead of being an anthropomorphic computer or other, we break out of the simulation; we break out of the substitution of a material human body with an avatar: Moini offers us a performative gift. Each choreographic constellation of playing with the bound steel cables of his metal-rod avatar in counterbalance with the weight of the water bottles via the pulley system is a fresh new start for the material encounter with our unknown other. One might interpret the idea of the usurpation of strength taken from the human and handed over to an abstract double as an avatar-making machine that mimics a mechanical materialized marionette. Later, this fully embodied puppeteering machine leads to a fleshed-out posthuman version of a half-being—half-alive and still dead, an in-between "third," reconstructed between human movement, performance, and skeleton-avatar form, leaving behind mere anthropomorphic mimicry. Both Moini's interdependent problematic avatar double marionette and the human player may be considered each other's non-fictional but force-driven and physically resisting avatar. The two dynamic performance movements crystallize in a constellation of what Spinoza (2018: 161) called *human bondage* that should be translated as our "servitude." This servitude relation is released, and the tension catapults the avatar composed of metal rods, carabiners, and steel cables up into the air at the end of the performance, until the metal rod avatar is left hanging, suspended in a deranged order: inanimate motionless matter.

2 In the song *Walking and Falling* of the 1982 album *Big Science* Laurie Anderson expresses the paradox of movement (walking) and falling: "You're walking. And you don't always realize it,/but you're always falling./With each step you fall forward slightly./And then catch yourself from falling./ Over and over, you're falling./ And then catching yourself from falling./And this is how you can be walking and falling/at the same time" (Anderson, 1982).

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"TEARS OF TRUTH"

ANTON REY, MIRIAM LAURA LOERTSCHER

1770, Denis Diderot describes in his famous *Paradoxe sur le comédien:* "Garrick sticks his head through a crack in the door and in the course of four or five seconds his facial expression changes from wild joy to moderate joy to calm, from calm to surprise, from surprise to amazement, from amazement to grief, from grief to dejection, from dejection to shock, from shock to horror, from horror to despair. From this last stage he climbs again to the starting point." (Diderot 1770; as cited in Wilson 1961). This is indeed an overwhelming act of acting and has often become a starting point for questioning the emotional conditioning, the "sensibilité" of actors. In the 20th century—from Konstantin Stanislavski's theoretical writings and practical approaches at the Moscow Art Theatre through Lee Strasberg, who commented that Diderot's analysis "has remained to this day the most significant attempt to deal with the problem of acting" (Strasberg 2012), or Bertolt Brecht, Jerzy Grotowski, Eugenio Barba, Sanford Meisner and many others—countless theories and practical approaches have referred to Diderot and his question about how actors can best perform an emotional scene in order to be credible, convincing, persuasive and truthful.

But how is credibility or "truth" to be measured and compared when talking about artificially produced emotions or rather deliberately produced emotional facial expressions? Does digital technology help or hinder distinguishing real from fake faces?

"Tears of Truth", an offshoot of the "Actor & Avatar" project, was conceived to systematically examine crying, blushing and other facial signals forming part of emotional expression from the perspective of production aesthetics. The aim was to develop a framework and extensive database in order to examine production mechanisms in professional acting and their underlying determinants. A close cooperation between several disciplines—acting, theatre studies, psychology and computer science—was started to investigate the production and reception of complex emotions like crying and blushing because of their cultural-historical importance.

Actors' access to and execution of emotional scenes are highly individual, making comparison a challenge, especially if we miss the opportunity to measure the emotion and ask about the subjective experience. Central in this investigation would be the expertise of professional actresses and actors. They would perform typical emotional states on a scale of increasing emotional intensity: joy, sadness, fear, anger and disgust, but also shame, pride, relief, as well as surprise, interest, pleasure, awe, triumph, and compassion, everything in fine gradation and convincing appearance. The coupling of theoretical, neuropsychological and practical expertise could help to better understand how professional actors perform a role and express feelings "on demand". "The mark of a good actor or actress is indeed the ability to cry on command" (Nochlin 2004). An investigation on facial expressions—both performed live and reproduced digitally—would help to model emotions along stringent

professional lines, with a resulting repository—a "data model of emotions"—aiming to raise awareness of how "true versus false faces" are made and how they influence audience perception.

Professional acting expertise has developed at least since the 1760s, when the rise of psychologically realistic, natural acting served the self-representation and self-assurance of the bourgeoisie (Kreuder 2005). But although acting is one of the dominant arts in popular culture, how professionals process and audiences understand acting is still largely under-researched. Most reception studies in psychology and related disciplines work with acted stimuli, but very few discuss the production aspect of acting (e.g. Goldstein and Filipe 2018). Little research exists on the artistic and creative sides of expressing emotional states, one is constantly thrown back to standard monographs and handbooks like Constantin Stanislavski's "An actor prepares", Uta Hagen's "Respect for Acting", Sanford Meisner's "Meisner on Acting" etc. Therefore, a practice-based research could bring together professional acting know-how with scholarly expertise from theatre studies and affective science. This combination would provide helpful material for the performing arts, anthropology, sociology, psychology, theatre and performance studies in understanding the mechanisms and cues underpinning the human processing of facial expressions. The role of the musculoskeletal mechanisms controlling the facial configurations supporting the recognition of prototypical or basic emotions, as well as of valence and arousal, in both spontaneous and voluntary expressions, has been studied, based on the concept of facial action units and addressing both static and dynamical parameters (e.g. by Cohn and Ekman 2005 or Cunningham/Dunfield/Stillman 2013). However, from a psychological point of view, the problem is multifactorial and concerns the following topics: a) inherent ambiguities and limited degrees of freedom in facial expressions per se: some visible movements can be produced by more than one muscle; naïve perceivers, for example, lack the terms of reference to clearly distinguish the diverse forms of smiling; b) artificial laboratory contexts in the constitution of databases, reducing the ecological validity of stimuli/expressions, including the composition of facial expressions that may not reflect genuine and sufficiently intense emotional states; and c) the focus on purely musculoskeletal mechanisms. Musculoskeletal mechanisms can largely be controlled voluntarily, leading to facial expressions that may or may not reflect actual emotional states, and which even attempt to hide emotional states, e.g. smiling in a social context when one is actually sad.

Business as usual for professional actors. But in order to study how an experienced emotion relates to expressive features, it would be important to be able to produce stimuli based on inducing and controlling emotional states. This can only be achieved with experienced actors, who are trained to use "enacted emotions", based on scenarios and invented situations, and coached by a director and a research partner. The distinction may seem evident from the outside, but the subjective difference between the controlled and the uncontrolled process is huge and only becomes steerable after years of intensive professional practice.

"The real good actor must act fully and completely, having laughter and tears and at the same time be so objective that you can absolutely see what your sister is doing in the first row of seats. That is real freedom on stage", Michael Chekhov stated in his 'Lessons for the Professional Actor'. It is this implicitness and prerequisite in a significant cultural industry which should be questioned. An investigation on mediated facial expressions, with a special focus on crying, blushing/skin colour, and mixed and masked emotions, as these are missing in available databases of emotional expressions. Faces are a small part of the human body, but a universe of communication.

Revealing, even joking on actors' means and efforts has become common on European stages. Onions, glycerine sticks and a variety of eye lubricants are popular little aids. Some make fun of tears and offer supposedly easy techniques for making them appear in any one's eyes (Schütz and Müller 2011, Schubert 2016). Strikingly, despite all these advice and supportive techniques, throughout the history of cinema, actors have repeatedly proven

capable of controlling facial expressions as tears like a language—often with adverse conditions on film sets or theatre stages. And although such expressions have been theoretically analysed in terms of their impact on audiences, they have not been systematically recorded in terms of applicable means and grades of modulation. Most research on acted emotions such as tears and blushing has focused on historical developments or the cultural-historical implications in the reception of emotional outbursts (e.g. Plessner 2003, Söntgen and Spiekermann 2008), or on psychological or medical factors (e.g. Vingerhoets and Cornelius 2012, Vingerhoets 2013; Wassiliwizky et al. 2017). Interdisciplinary attempts have been made to investigate the role of visual and emotional factors in expression recognition using technical methods such as fMRI, EEG and others (see Campagnoli et al. 2019, Jürgens et al. 2015, Schirmer and Adolphs 2017). However, the production of these processes by actors and professionals has scarcely been investigated: Do real tears differ from false ones?

Weeping is normally "linked to an explicit loss of control over oneself" according to Käte Meyer-Drawe (1999). Its course cannot be voluntarily controlled and largely eludes bodily control; it is an indication of the "fundamental unavailability of our bodily existence" (Meyer-Drawe 1999). So why are some people able to express false tears as if they were true? And why has the effect been investigated but not the cause, the deliberately produced art, the facial expertise? The human face is far from being fully discovered. It is the micro physiognomy of film that "distinguishes more finely and precisely than the most exact word, and thus it has not only an artistic but also an important scientific vocation" (Balázs 1980). So which factors influence the truthfulness and so-called authenticity of the tears, blushing, pupil dilatation or more generally facial expressions of emotions, produced by professional actors? Is it possible to test and compare these with empirical methods? A lab-like recording studio and a predifinite script should remain the same for all actors and actresses to start with. Then let them act, track and compare. And as an encore at the end the digital processing of the videos for asking what are the consequences of communicating increasingly through digital interfaces in today's society.

STILLS FROM TEST RECORDINGS WITH PROFESSIONAL ACTOR GOTTFRIED BREITFUSS.
ZURICH UNIVERSITY OF THE ARTS, 5 FEBRUARY 2020.

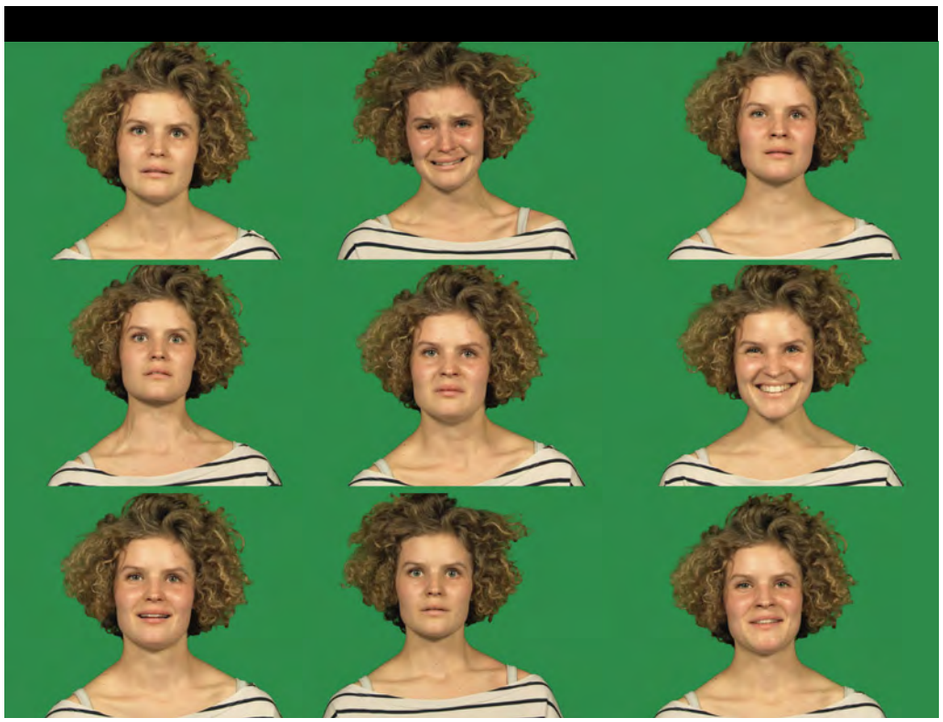
Crucial questions for the professional actor and actress on the forensic search for tiny signs, markings revealing the fake, the seams, sutures, hems, the pixels, the face a stage more than a "mirror". If masking an emotion implies emotion regulation, does faking an emotion regulate facial expression? Diderot's answer to where do an actor's tears come from was "from his brain" (Diderot 1994). But the brain is a wide expanse with plenty of space on the surface, and access is best when lead by the subject.

How we are perceived does not always tally with that we are attempting to show, as Goffman highlighted in his landmark "The Presentation of Self in Everyday life" (Goffmann 1959). The gap in reception between performer and spectator, which occurs in real life as much as in theatrical performance, underpins our interest in the artistic modelling

of the actor's alienation through an "avatarisation" of his or her face. How using different acting techniques can generate expertise in characterizing a virtual avatar. Results from the "Actor and Avatar" project show that, at least for fearful emotions, the brain's reaction to avatars and actors can be differentiated by fMRI (see Kegel et al. 2020) or EEG (see Sollfrank et al. 2021). Of potential clinical relevance, this differential response is modulated by an observer's history of temporal lobe epileptic seizures.

To fill this gap we miss a database with high-resolution video recordings of many professional actresses and actors taking diversity and demographic aspects into account, and possibly a number of acting students and non-professionals to compare the different levels of expertise, especially in producing complex emotions and the associated physiological processes.

The project should leverage knowledge and corresponding predictions about the relationships between emotions and ANS-mediated physiology. For instance, intense fear in the face of proximal danger increases sympathetic tone, inducing pupil dilatation and a pale face, while pleasure in a safe environment increases parasympathetic tone, inducing pupil contractions and making the face redder due to the influx of capillary blood in the skin. Moreover, some emotional states may induce a combination of increased sympathetic and parasympathetic tone, as in anger, where the heart rate can increase while the face becomes redder. These relationships enable defining conditions having diverse possible associations and dissociations, in which the musculoskeletal and ANS-related facial features corresponding to a given target emotion may be consistent, inconsistent, opposite or disconnected (cf. Tisserand/Aylett/Mortillaro/Rudrauf 2020).



STILLS FROM TEST RECORDINGS WITH STUDENT ACTRESS ALEXANDRA HUSS.
ZURICH UNIVERSITY OF THE ARTS, 5 FEBRUARY 2020.

To study the differential role of musculoskeletal and ANS-related parameters in the recognition of facial expressions of enacted emotional states and to focus on the role of consistent versus inconsistent musculoskeletal versus ANS-related parameters, relating to different degrees of hiding of emotional states in facial expressions, as often involved in social contexts; but also to analyse how changes in acting are linked to self-reported empathy. One should create an inventory of expressions (behaviour, signals) with repetitions and variations; to capture the complex visual signals involved in the physiological processes needed to express emotions and to ask whether actors can actually change their physiology and how human express these reliable "mussels", i.e. signals. To produce such a database with enough context information would include actor rehearsals, recordings and interviews, pursued along a script for the recording sessions and discussed with acting experts from the academic and collegial community in focus groups. The participating actors would perform to generate a set of typical emotional states (emotion factor), starting from a neutral face with increasing intensity (intensity factor), retaining a minimum of five to a maximum of nine target emotional states, depending on

time constraints related to actor availability and to successfully inducing emotional states. They would act basic and mixed emotions based on a fixed scenario. Samples and sessions would be recorded on high resolution video. If texts are needed, they would be based either on "pseudo-sentences", representing word emphasis with possibilities for voice modulation ("Kem bes belàm tebùl nikalibàm folìd…") or on so called vocalizations ("aah" sounds).

The professionals would perform along a catalog of keywords, triggers and imagination-helpers and evaluate their acting by completing a short questionnaire after each performance and a longer version following their session. The questionnaire would be developed on standardized measurements of empathy at the end of their session with questions and topics about the acting process such as: Did you feel "hot or cold"? Could you describe your body sensations connected to each emotional state? While watching the recorded expression (at the end of the session): Describe the method used regarding each emotion, condition and level of intensity? What were you thinking (e.g. mental imagery)?

Given the complex and demanding research design, a contingency plan could argue if actors do not succeed in independently and systematically controlling their ANS-related facial features, one can focus on mixed and contradictory emotions: e.g. trying to play nice by smiling when feeling deeply scared or sad, which might be easier to enact. Thus, for instance, actors' musculoskeletal facial features would express joy, while their ANS-related features would express distress (high pupil dilatation, paleness, tears). And if actors would not succeed in producing ANS-related facial features which would be sufficiently intense to be clearly discriminated, one could use image processing and virtual avatar manipulations to enhance their appearance and evaluate the extent to which, even under such artificial manipulations, ANS-related features may contribute to attributing emotional states to others.

This setup could lead to probable answers on how do avatars (i.e. digital masks) differ from realistic pictures and possibly influence the reception of (acted) emotions? Can the perceived emotional state attributed to avatars be manipulated based on ANS-related parameters? Can the specific practical knowledge of actors help to explain these processes?

- Does the method enacted or the recording distance etc. influence the degree of intimacy?
- Can the influence of instructions be measured and verified for specific scenes or actings?
- Are some acting methods more supportive to this kind of task than others?

The project could generate a unique database of stimuli that could be shared with different communities and contribute to other research in many fields. Performing emotions can be regarded as a dynamic neuropsychological and -physiological process. Actors are normally not aware of these processes and scientific reflections or even too much thinking can hinder simulating social interactions on stage or in front of a camera. The documentation and publication of such recordings could fill a gap by investigating interindividual similarity, comparing the measured data and clustering analyses to distinguish response patterns during acting; thematically, this would address the disciplinary and cross-disciplinary emphases of such a project: acting, programming and psychology.

Three perspectives and disciplines that would develop tools for experiencing complex emotions in production and reception, but also verifying and possibly establishing tools for falsifyingexpressions on screens. This study would likely foster a debate on acting traditions, bring together experts from various (applied and theoretical) sciences to discuss a core yet implicit topic and create deeper understanding of acting through comparison.

Last but not least, this research project on the relative contribution of acting and of musculoskeletal and physiological facial parameters to the perception and recognition of emotional states emotional states in others has not been done yet.

Is it not monstrous that this player here,
But in a fiction, in a dream of passion,
Could force his soul so to his own conceit
That from her working all his visage wanned,
Tears in his eyes, distraction in his aspect,
A broken voice, and his whole function suiting
With forms to his conceit? And all for nothing —
For Hecuba!

"Hamlet describes the physical consequences of feeling. The player's body is transformed by his passion, his intense emotion. (...) It is all a game, all pretend. But the tears are real." *(Taylor and Bouros 2016)*

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III. DOLLS, PUPPETS & UNCANNY TRACKS

GET INTO THE UNCANNY VALLEY

DIETER MERSCH

> *From a Buddhist point of view, to be* fully *human requires a radical rethinking of what it means to be a human in the first place.* *Borody 2013: 36*

MASAHIRO MORI'S BUKIMI NO TANI GENSHŌ

In 1970, Masahiro Mori, a Japanese roboticist, published a hypothetical essay entitled, *Bukimi no tani genshō.* The discussion of this essay in Jasia Reichardt's 1978 book, *Robots: Facts, Fictions, and Predictions,* introduced the topos of the "uncanny valley," as Mori's title was translated, to a wider audience.[1] Mori's hypothesis, based on speculative rather than empirical evidence, was that the closer the resemblance of an artificial hominoid to a human beings, the eerier we find it. Typical reactions are shock, fear, or revulsion. Putting aside the fact that this hypothesis was not backed up by empirical data, and its validity has therefore always been and perhaps always will be a matter of contention, the focus of the essay at hand is the plausibility of its implicit intuition.

The title *Bukimi no tani genshō* can be read in different ways. While the Japanese word for uncanny, *bukimi,* is part of the title, it refers to *genshō,* phenomenon, so that a more literal translation is "when phenomena become uncanny." *Bukimi* means not only uncanny, but also uncanniness or weirdness, as well as the more spectral "eerie." Decisive for Mori's theory is the process of *shinwa-ka,* which he placed on the y-axis of his graph. *Shin* means heart and *shinwa* means myth or, one could also say, the mythology of the heart or feeling, whereby the suffix -ka can signify negation or, in this case, the demythologization of emotion. In that case, *shinwa-ka* would have to be translated as "unfamiliarity," but with a focus on process or on the demystification as in "becoming unfamiliar." Since Japanese thought is always dialectic, comprising ambivalences and the simultaneity of positive and negative aspects, the word can mean both the synchronicity and the asynchronicity or dissonance of emotions. This strange shifting is important. What has become known as the "uncanny valley" refers in the main to this instability and its temporality. We are not dealing with a *state,* but with a dynamic within which the transition from familiarity to unfamiliarity takes place. Also lost in the translation "uncanny" is the meaning of the original German term *"unheimlich"* which

1 Reichardt 1978. New translation: https://spectrum.ieee.org/automaton/robotics/humanoids/the-uncanny-valley, IEEE Spectrum, 29 Dec. 2017 (22.06.2021). In 2005, Christian Keysers, Frank Pollick and Karl MacDorman organized a workshop on the uncanny valley at the fifth IEEE-RAS International Conference on Humanoid Robots in Tsukuba, Japan. In a letter addressed to this workshop, thirty-five years after first proposed the concept of the uncanny valley, Mori stated: "While I introduced the notion of the Uncanny Valley, I have not examined it closely too far." Nevertheless, he also included two short personal observations regarding the concept of the Uncanny Valley, both of which are critical of its original formulation. See MacDorman et al. 2009: 695–710.

refers to a feeling of being at home, *heimisch.* Mori was interested in a similar *momentum* of loss due to some irritating detail or barely noticeable dissonance able to set off a sudden change of relationship. "To a certain degree, we feel empathy and attraction to a humanlike object," Mori said in conversation with Judit Kawaguchi (2011: 1), "but one tiny design change, and suddenly we are full of fear and revulsion."

Mori illustrated this in his original text using the examples of myoelectric silicon prosthetics and animated robots:

> ***Movement-related effects could be observed at the 1970 World Exposition in Osaka, Japan. Plans for the event had prompted the construction of robots with some highly sophisticated designs. For example, one robot had 29 pairs of artificial muscles in the face (the same number as a human being) to make it smile in a humanlike fashion. According to the designer, a smile is a dynamic sequence of facial deformations, and the speed of the deformations is crucial. When the speed is cut in half in an attempt to make the robot bring up a smile more slowly, instead of looking happy, its expression turns creepy. This shows how, because of a variation in movement, something that has come to appear very close to human—like a robot, puppet, or prosthetic hand— could easily tumble down into the uncanny valley.*** *(Mori 1970: 4)*

THE DIAGRAM

Mori's text illustrates the process of the uncanny valley in the form of a fictitious curve that first ascends and then makes a sudden steep descent only to again climb to familiarity and synchronicity. It ends at an approximation of confrontation with a familiar person or object. The curve, which, as stated above, makes no claim at empiricism, resembles a wave that bounces between two extremes. The example furthest from human likeness is industrial robots, the acceptance of which, in Mori's observation, only becomes problematic when they take on the appearance of human beings. This effect is intensified when artificial figures are animated. Still images are less problematic than moving images or animated dolls, interactive avatars, or ghostly apparitions.

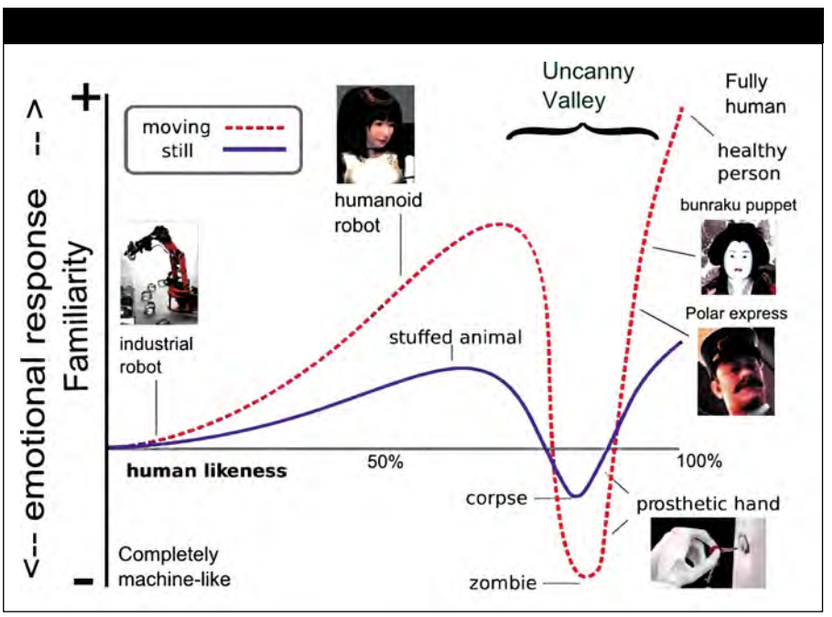

FIG. 1
GRAPHIC ILLUSTRATION OF THE UNCANNY VALLEY

Mori based this observation on his personal experience that growing perfection, especially in the development of prosthetics, could quickly flip to become the opposite. For example, hand protheses that look like the real thing nevertheless remain cold and lifeless, which can cause a moment of shock when somebody shakes the hand. Theodor W. Adorno (1996: 61) describes a similar shock during a meeting at Charlie Chaplin's house:

> ***Together with many others we were invited to a villa in Malibu … While Chaplin stood next to me, one of the guests was taking his leave early. Unlike Chaplin, I extended my hand to him a bit absent-mindedly, and, almost instantly, started violently back. The man … [had] lost a hand during the war, and in its place bore***

> *practicable claws made of iron. When I shook his right hand and felt it return the pressure, I was extremely startled, but sensed immediately that I could not reveal my shock to the injured man at any price. In a split second I transformed my frightened expression into an obliging grimace that must have been far ghastlier.*

Tellingly, Adorno uses the word "claw," illustrating the unbridgeable difference between a prosthesis and a hand. A claw has a bestial, monstrous and therefore alien element. Mori is interested in this moment of alienation: That which is too similar becomes dissimilar and revolting, like a corpse that is no longer the same as a living body and which sparks a mixture of revulsion and fascination, necessarily including a moment of spontaneous distancing.

The diagram clarifies this with the level of similarity and familiarity on the y-axis, while various humanoid figures are placed along the x-axis, from simple robots to fictional characters or *Bunraku* puppets. In between, at the lowest point, are the epitome of all specters, zombies, the undead who walk again between the worlds, creatures that still exist today in voodoo magic, unable to live or die, but forced to wander aimlessly in no category at all. The logic of Mori's graph is simple:

> ***This kind of relation is ubiquitous and easily understood. In fact, because such monotonically increasing functions cover most phenomena of everyday life, people may fall under the illusion that they represent all relations. Also attesting to this false impression is the fact that many people struggle through life by persistently pushing without understanding the effectiveness of pulling back. That is why people usually are puzzled when faced with some phenomenon that this function cannot represent*** *(Mori 1970: 1).*

Interestingly, the graph pertains only to the visual level. It shows a function of perception alone, while also expressing a relation. Hence it says nothing about the realism of the figures themselves, but merely about our experience of them, that is, the way in which we meet them. Although the uncanny valley hypothesis today plays a role in the theory and practice of digital simulations, it describes less the boundaries of virtual systems and their hypermimetic construction and more the question of what we see and hear and hence the *aesthetic decidability and undecidability of phenomena.* Seen in this way, one could speak of a Turing Test for the eyes and ears.

BEYOND CATEGORIES

Although Mori's argument was intuitive and heuristic, empirical studies since then have attempted to both prove and disprove his hypothesis.[2] But confirmed or rejected, the question remains of the *effect* the graphic curve is actually representing. The interpretation closest to hand is that we look at, and react to, avatars, robots, and other artificial objects differently than we do to other human beings. This difference does not manifest itself as a classical metaphysical differentiation such as made between human and artificial intelligence, or between nature and technology, reality and media, etc., all of which presuppose a categorical distinction, but between that which can be categorized at all and that which cannot. It is decidability itself that is in question. This idea of an inability to categorize goes back to an early attempt at explaining the concept by Ernst A. Jentsch in his 1906 essay "On the Psychology of the Uncanny," which Freud references in his essay "The Uncanny," although he did not agree with Jentsch's conclusion.[3] For Freud, the root of the uncanny lay in childhood experiences that had been repressed and suddenly emerged from the unconscious, while Jentsch focused on the doubtfulness of categorizations, that is the question of what something is: Alive or inanimate? Human or non-human? Real or simulated? Importantly,

2 Around two-thirds of the studies on the uncanny valley, mostly in the fields of psychology and theories of perception and cognition, support Mori's hypothesis, although they did not find a deep "valley" but rather a slight fall that flattens to the extent that we are familiar with simulations and other artificial figures in films, computer games, and virtual reality modelling. Decisive is whether one is looking at static images of deceptively realistic "faces" or moving images with facial expressions, gestures, and voices. The most prominent defenders of the theory are MacDorman and Chattopadhyay 2016; in contrast, a 2009 empirical study claims that humanlike androids that were barely distinguishable from humans were not liked less than humans; see Bartneck, Kanda, Ishiguro, and Hagita 2009.

3 On the phenomenon of the uncanny see Jentsch, 1997 [1906] and Freud 1955. Freud draws explicitly from both Jentsch and the uncanniness of the automata in E.T.A. Hoffmann's *Night Pieces.*

he stressed not only discrepancies in the ability to categorize, but also multivalence and cognitive dissonance. Whichever explanation one prefers for the phenomenon, at the fore is always something undefinable or ungraspable that resists all attempts at rationalization. This is illustrated particularly well in the literature of German Romanticism and its rejection of Enlightenment and the belief in reason; one need only think of E.T.A. Hoffmann, Novalis, Achim von Arnim or Friedrich Schlegel. Seen in this way, the uncanny addresses an uncontrollable, non-rational reservoir of obsessions that waylay us and cause feelings of fear—or its opposite, the sublime—creating an aura that in theology was linked to the *mysterium tremendum et fascinosum*. The uncanny is hence similar to a state of unresolvable ambivalence or a loss of meaning—that moment at which concepts become confused and our intellectual capacities suspended, when we stare into an unfathomable abyss and can no longer trust our senses. Mori's uncanny valley denotes exactly this moment of destabilization—the inconsistency of conceptual frameworks, the gap in the system of logical classification.

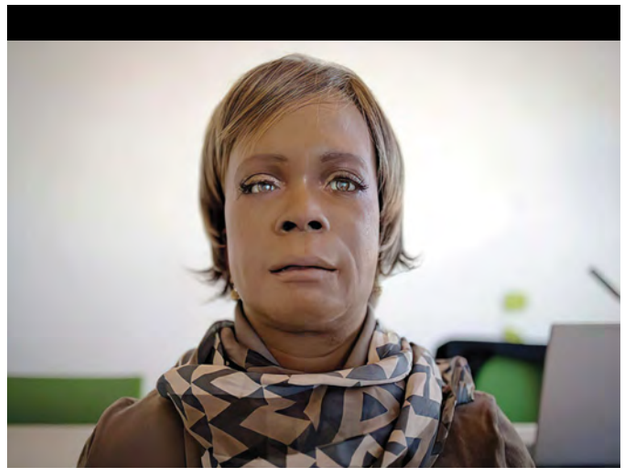

FIG. 2
HUMANOID ROBOT
HTTPS://MEDIUM.COM/SWLH/THE-UNCANNY-VALLEY-5C6D62CC1BB8

There is only a trace of this in Mori's graph; it is an insufficient metaphor for the sudden drop that, in the technological or digital age, defines the turning point of mathematical rationalism or that point at which mathematical calculation melds with the incalculable. Within a formal system, it marks the loss not only of any and all criteria but also of certainty, and of any testimonial function, hinting at the fragility of mathematics. At the same time, it reminds us that nothing about our usual perceptions or social relationships should be taken for granted, for they no longer apply when confronted with an alterity that we have no means of relating to.

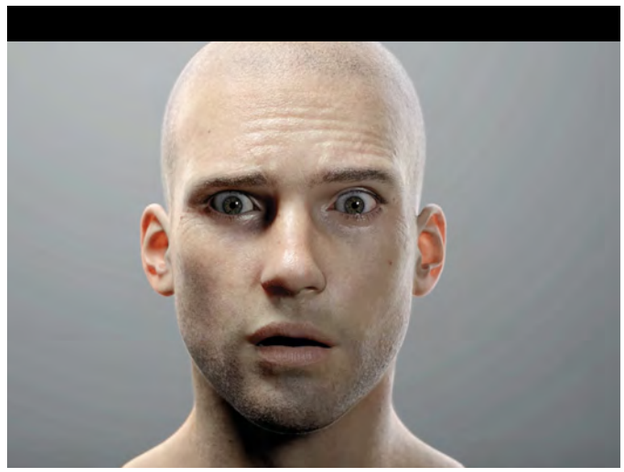

FIG. 3
"ED," FACIAL ANIMATION WITH MIMICRY AND EXPRESSION BY CHRIS JONES
HTTPS://WWW.DIGITALPRODUCTION.COM/2014/10/08/TSCHUESS-UNCANNY-VALLEY/

ETHICS OF DISSIMILARITY

Mori was not looking for a positive use for his heuristic of the uncanny valley. He was not, for example searching for the threshold that robotics and virtual reality research would need to cross in order to successfully create the "really" perfect illusion. His interest was in the opposite. Mori propagated an ethics of design that followed the primacy of dissimilarity, not of similarity or the "as-if" (Reichardt 1978: 26–27):

FIG. 4
RENDERING AN AVATAR IN A MOVING IMAGE

> *We should begin to build an accurate map of the uncanny valley, so that through robotics research we can come to understand what makes us human. This map is also necessary to enable us to create—using nonhuman designs—devices to which people can relate comfortably (Mori 1970: 5).*

Consequently, our aim should not be to optimize similarities in order to in the end create beings that we could mistake for other people—real children, flight attendants, consultants, or caretakers—but rather to expose their constructedness so that we are clear of their non-human status at all times. Mori therefore proposed a moral principle for robotics according to which all humanoids would be able to communicate with us "understandably" or interact with us "meaningfully" without either moving or acting or looking like human beings. Only in that way could we prevent aversion and achieve social acceptance (Borody 2013: 33). He therefore came to the conclusion—in opposition to the leading trends in robotics and in cinema—that we should privilege nonhuman design and create artificial or artful sculptures. Following that logic, rather than the technical precision of the "Vienna Hand," the prostheses with which he began his explorations, it would be better to create something along the lines of the wooden hands modeled for Buddha statues that are, like the figure they are attached to, but literally, "sympathetic," if perhaps less "manageable."

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POSTSCRIPTUM

When Masahiro Mori published his essay in 1970, he could not have known the extent to which, 50 years later, we are surrounded, indeed occupied, by humanoid beings of all kinds: not only cyborgs and humanlike robots, but also other artificial creatures more reminiscent of bugs, cockroaches, dogs and the like. On screen media, moreover, we get to see a wide variety of artificial faces, both fictional and of apparent "real" human faces which seem to be indistinguishable from portraits of existing humans. We are also confronted with avatars, animated monsters, even lifelike dinosaurs or cartoon characters mingling with human beings as if they were living in the same space. Perhaps the strangest and creepiest of all these creatures, however, are certainly the *Real Dolls* made of silicone, equipped with rudimentary software or AI to satisfy our sexual appetites and which are capable of minimal conversation, but also of articulating emotions. Or better yet, they form nothing more than dummies oriented exclusively to male masturbation practices. Mori in the first place raised the question of our relationship to such beings. His approach suggests that the more realistic and human-like these artificial beings appear, the more frightening or eerie they become. But beyond affection, we have to ask what kind of "relationship" we can have artificial beings at all, and here sex dolls serve as a perfect example, because our relationships with them tell us a lot about our social self-understanding. And as far as the basic question of the *Actor & Avatar-project* is about general relationships to human-like artifacts and their possible play with identity and alterity, we—in the face of dolls—are immediately confronted with the abyss of the *Uncanny Valley,* because they are obviously objects that are supposed to arouse desire and not aversion or rejection by feelings of uncanniness. It thus seems that, by their very nature, they are already paradoxically structured. In any case, with *Real Dolls* we are dealing with the perhaps most extreme example of what ignites the question of possible differences in modes of reference, i.e. how we behave towards them, whether they function, as parts of the Actor Network Theory would claim, as independent actors, who participate in a symmetrical order, whom we must acknowledge as partners or integrate into our collective life, or whether they are different from any human being and thus generate the reality of social asymmetry.

Sex dolls, sex machines, and their various configurations can thus be seen as paradigms that question the mere assertion of equal relations between humans and artifacts and hence raise the deeper problem of the peculiarity of "human" or "social" relations in contrast to relations to mere things or technical apparatuses, no matter how perfect they are designed or not. Consequently, they can be conceived as test figures on the basis of which the hypothesis that we behave in a different way towards artificial beings or other technical objects than towards humans can be proved. The assertion of symmetrical networks thus obviously skips over the specific *ethicity of reference,* so that the circle of behaviour is expanded as if there were a mutual interchangeability between the social and the technical or material. Certainly, things or technical devices open up new possibilities of behaviour—but also of distortion, think of the crudeness of dealing with defective appliances. Such practice we would never allow ourselves toward other humans; indeed, if we were dealing with them in such a way, we would turn away in disgust and penalize the violation. The intuitive reserve, the moment of terror that Mori anticipated (for humanoid robots were still utopia in his time), thus concerns not only the artificial creatures and the degree of their similarity—this is true only on the level of perception—; instead, they point directly to ourselves, i.e., to what we feel and may be capable of. In other words, they touch the core of our "social" competence and its possible deformation.

Sex dolls, however, can demonstrate the already existing degree of this deformation. It is therefore obvious that feminist approaches, as well as artists in particular, have addressed them and the fantasies of masculine desire they embody. The approaches are as diverse as they are controversial. Some incorrigible apologists invoke the freedom of fantasy,

the right to act it out within the boundaries of one's own imaginary—disregarding the fact that every moment of this fantasy has already reduced the female body to a mere object of possession. It is not so much the moral indignation that counts here, but rather the sedimentation of power-relations which are already inscribed into the plastic skin of the dolls as ever-ready sex vessels. Other apologists see in the use of intelligent sex robots the possibility of combating human trafficking and the sexual enslavement of women—by shifting violence into a surrogate act. Apart from the fact that there is no empirical evidence for this position, it is an illusion to believe that surrogate acts protect against real acts. In contrast, Megan Walker, in one of the most famous campaigns against sex dolls in Germany, launched by the EMMA magazine, recognized in silicone substitutes the "ultimate devaluation of women," virtually their "dehumanization." Reduced to a ready-made consumer article, sexuality becomes a mere use—or even abuse—because "what could be more interchangeable than a silicone doll?" And further, "The sex doll is every woman who has rejected him; every woman he cannot have; every woman who has been more successful than him; who has been praised more than him; who has been more desired than he could ever have dreamed…" The pamphlet appropriately criticized these fetishes as projection-screens, as mere surfaces for power-fantasies and inferior desires for revenge. In her study *Living Dolls. The Return of Sexism,* Natasha Walter furthermore blamed the ubiquitous sexualization and trivialization of women through pink dolls, dresses, and other children's toys for stylizing themselves into objects and thereby furthering their alienation. The doll cult is thus diagnosed as the fruit of a hypersexualized culture, which at the same time provides information about how it shapes and organizes the relationship between the sexes.

FIG. 5
REAL DOLL
SEE HTTPS://WWW.REALDOLL-SHOP-AUGSBURG.DE/P/JETZT-VORBESTELLEN-MANGA-TPE-REAL-DOLL-LIEBESPUPPE-DEE-138CM-INKL-STANDFUSS-FUNKTION

More than 100 years of women's emancipation is thus undermined and turned into its paradoxical opposite: as freedom for humiliation and self-abasement. Moreover, it correlates with the pornographic industry and its everyday presence not only in film and advertising, but above all on the Internet and in social media. At the same time, it produces what in its outward appearance companies like *Realbotix* or *Abyss Creations* offer to worldwide customers for consumption: hyper-realistic sex dolls or AI-supported sex robots whose faces can be designed according to photos of prominent or desirable but unattainable female objects.[1] One of the most prominent of those products, *Harmony,* is modelled after Pamela Andersen. She smiles, squints her eyes, moans and whispers to her would-be lover, "I was created to give you pleasure." According to *Lumi Dolls,* a company that tried to run a sex doll brothel in Barcelona, the doll-objects are perfect submissive partners. Consequently, as Laura Bates has put it rightly, having sex with them means committing already a rape. Made for the unrestrained acting out of one's own urges and drives, they can be nothing more than misogynistic wish fulfilment; however rape is not a mode of sexual play, nothing that promises satisfaction of a sexual desire, and hence "not an act of sexual passion," but the destruction of every possible form of human relationship, because it devastates the relational capacity of the raped person itself. One must therefore distinguish these sex dummies from cheap and innocuous sex toys. Clearly, sex aids have long existed,[2] but sex robots in contrast position women as such as toys to play with. By making these robots as realistic as possible—from self-warming models to those that speak and suck, from some with a real pulse to others that flirt with their owners—their creators are selling far more than just an inspirational plaything, because they effectively reproduce real women with imitated properties, mostly bodily exaggerated, however without any will and autonomy. Their consumers thus buy the total lack of will.

1 The order situation is not small: up to 600 hyper-realistic sex dolls per year are delivered to customers worldwide with an amount of more than 12.000 $ per doll.

2 See for example the historical investigation of Ruberg (2022). From a sociological and philosophical perspective see also Bendel 2020.

Undoubtedly, sex dolls are a symbol of an excessive economization of the female body, which at the same time is disfigured by burlesque overstatements of secondary sexual attributes. It is no wonder, however, that the initial critical statements were in turn transgressed by feminists to the effect that, conversely, a performative reevaluation of the dolls was advocated, for instance through their repurposing or appropriation as instruments of a liberation from heteronormative constraints. Tanja Kubes, for example, has pointed out that the development of intelligent sex robots could hold significant queer potential, such as by helping to enable sexual satisfaction and emotional connection beyond masculine domination in "post-" and "transhuman" futures. Similarly, John Danaher in *Should We Be Thinking About Sex Robots?* has attempted to frame the strict rejection of "sex tech" by placing technical companions in a complex history of artificial objects of satisfaction. However, this presupposes that they shed their manifestly sexist appearance, their tendency to degrade women to their mere external sexual features in order to shape them beyond fetishization. Performative inversions and transvaluations are therefore always also a design task.

Such a productive *heteromorphosis* can be seen in particular in the numerous artistic explorations of the *Real Dolls* and other sex machines; think of filmmakers such as Elison De Fren (in this volume) or Maria Arlamovsky[3] or photographers such as Elena Dorfman (in this volume) and Alexandra Aderhold or the artist Arvida Byström, to name but a few.[4] In her exhibition *A Doll's House,* the latter shows selfies together with the silicone doll *Harmony,* which is, as it were, sympathetically brought into a consonance with her own body in order to skewer the manifest obsession with identity-politics in digital media, especially Instagram or Tik Tok. In a sense, it is the critical production of synonymity on the basis of *hypermimetism,* the goal of which is virtual assimilation, reduplication, and thus the standardization of one's own existence. For this purpose, the doll is tanned with spray, her hair is dyed, and she is put into the same girlish clothes of the artist, in order to assimilate her appearance to the doll in the same way as the doll's appearance to the artist. Consequently, there is a danger of confusion, which, despite all the sweetness of the pictures, creates an eerie and threatening effect. Precisely because the images appear to be affirmative, dipped in exaggerated pink or displayed as glossy transparencies, this uncanniness in turn implies a distance that corresponds to that predicted by Masahiro Mori in his *Uncanny Valley* essay. At the same time, the images imbue both "beauties" with a melancholy of futility that makes it clear that the cold reality of technical perfection, which compensates for human's supposed lack, transforms itself into deficiency in order to leave the human body damaged.[5] The technical, as a human invention, can do nothing but producing imperfection; therefore technology is not suitable as a standard for transhumanist utopias.

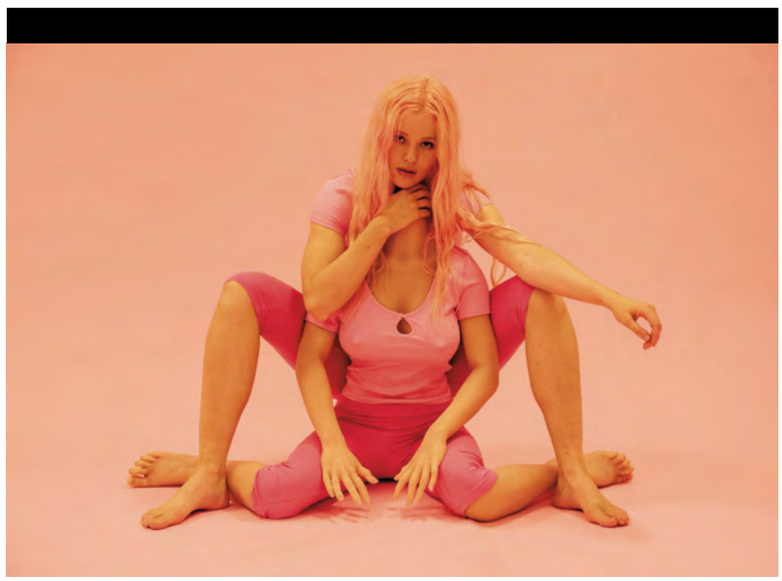

FIG. 6
ARVIDA BYSTRÖM, *A DOLL'S HOUSE,* 2022.
SEE HTTPS://WWW.ANOTHERMAG.COM/ART-PHOTOGRAPHY/14308/ARVIDA-BYSTROM-SEX-ROBOT-THE-DOLLS-HOUSE-EXHIBITION

Whatever one's attitude to sex dolls and sex robots however is, no opinion proves innocent. This is true for both the critical ones and those that primarily use artistic strategies of performative transformation or "negative affirmation," not to mention the apologetic ones. This is due to the fact that in every attitude a certain type of social relationship is implemented, which must first be worked out. A basic assumption indeed to assume an essential

3 https://futurezone.at/digital-life/es-gibt-keinen-sex-mit-robotern/401063730

4 https://www.arvidabystrom.se/

5 See with regard to the deficiency of human beings and the deficiency of technology also Heßler 2023.

incommensurability of types of relationships—that is, that we behave differently toward technical things, or artificial creatures than we do toward other human beings, because, as Maurice Merleau-Ponty rightly put it, relations "among men (…) that are human" are always already socially terminated, i.e. grounded in a certain form of sociality, whereas the human-machine relation as well as the human-object relation do not actually function socially, but can at best be derived from the primordiality of human-human relations. This also means: We must already be in a social space in order to be able to develop "bonds" to objects, be it for sentimental or libidinal reasons. Human-doll relations therefore always exist only as reductive relations: as projections, fetishizations, or pathologies. This inevitable reductivity also denotes the error of the widespread symmetry postulate from certain readings of Actor-Network Theory.

Philosophically-theoretically as well as empirically, the claimed difference can be seen in encounters with avatars and with human faces. In accordance with the conviction that truth is often only decuviated in exaggeration, *Real Dolls* can also serve as models for this thesis beyond the avatar/face difference. It is less about the woman as an available "commodity", about her objectification and reduction to a number of body orifices as templates of male greed—denouncing this form of desire as a form of mere violation is certainly correct—but primarily about the fact that any kind of doll sexuality necessarily distorts what sexuality means, namely in the sense of Sigmund Freud's "libido" as a true social binding force, or *koinōnia*. This is why the dolls occupied such a prominent position in the various investigations of the project: as paradigms, taken to the extreme, of a discontinuity or even incompatibility that dissects the social itself. One could say: the fact that the phantasm of sex dolls has become reality in the *Real Doll* is itself already a symptom of an immanent destructiveness in the social.

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THE MECHANICAL BRIDE AND THE AMBIVALENT PLEASURES OF THE UNCANNY

ALLISON DE FREN

The theory of the "uncanny valley" or *bukimi no tani* (the valley of eeriness) has, over the last decade, shifted from the margins to mainstream culture. Coined by robotics professor Masahiro Mori (1970) in a paper in an obscure Japanese journal called *Energy,* the theory suggests that as anthropomorphic creations, such as robots, start to approximate humanness in both appearance and movement—raising expectations of humanness, but not quite meeting them—they will begin to seem creepy, plunging those who experience them into the Uncanny Valley. Although Mori's theory received little attention when it was published, it has attracted ongoing interest as the lines between the human and non-human humanoid have started to blur, and it has made appearances in both the media and the academy in relation to everything from CGI (computer generated imagery) bodies in animation to game avatars to plastic surgery. In the process, as often happens with the popularization of ideas, longer histories of the uncanny have been sidelined, especially those in which its effects have been used to evoke ambivalent pleasures. This historical legacy includes automata builders, Victorian magicians and showmen, gothic writers, surrealists, and even the earliest filmmakers, whose uncanny creations limned the border zones of pleasure and displeasure, desire and fear, identification and abjection. Especially now, as rapidly advancing technologies increasingly enable our anthropomorphic creations to sidestep the Uncanny Valley through heightened levels of realism, it is helpful to review how and why the uncanny has been actively courted.

My own interest in the ambivalent pleasures of the uncanny was cultivated during a ten-year period exploring the world of artificial companionship while making a feature-length documentary, entitled *The Mechanical Bride* (2012).[1] Inspired by the Marshall McLuhan book (1951) of the same name, it examined the science fiction fantasy of creating the perfect artificial woman and the developing reality of artificial companions within the sex and robotics industries. Included in the documentary were interviews with men who build and buy sex dolls, those who repair them, and those attempting to enhance them with robotics and AI technologies. I also interviewed a number of artists and writers as fascinated by human/nonhuman relationships as I was, including fine arts photographer Elena Dorfman

1 https://vimeo.com/ondemand/themechanicalbride

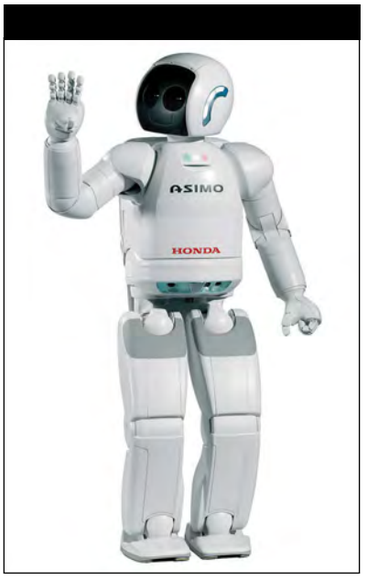

FIG. 1
HONDA'S ASIMO

(Still Lovers, 2005); author Gaby Wood (*Edison's Eve: A Magical History of the Quest for Mechanical Life,* 2003); author Victoria Nelson *(The Secret Life of Puppets,* 2001); and Robert Parigi, the first director to use a life-sized silicone sex doll in a film *(Love Object,* 2003).

The seeds of the documentary were first planted in my former life as an interactive media designer during the late 1990s, while working at a future technology research and development company in Palo Alto, California, the heart of Silicon Valley. While there, I befriended a number of roboticists—all male—who first introduced me to the theory of the Uncanny Valley. At the time, Mori's theory held sway over the creation of robots worldwide, including those being developed by my colleagues, all of which were non-realistic. (The humanoid robotics industry in Japan would shortly thereafter receive worldwide attention for Honda's ASIMO and the Sony Dream Robot, both of which eschewed realism and were reminiscent of 1950/60s science fiction film robots and/or life-sized toy robots.)

My co-workers also introduced me to the Realdoll, a life-sized silicone sex doll manufactured in Southern California, which achieves a remarkable degree of verisimilitude. The company that makes and sells *RealDoll,* Abyss Creations, had just launched, and my colleagues were considering buying a doll, opening it up, and installing robotics technologies as a way of testing out a more human-looking robot (Abyss, of course, had the same idea and now, 20 years later, it is offering robotic/AI dolls). Although the plans of my robot colleagues never came to fruition, the desire to install robotics technologies into a human-looking doll became a kind of thought experiment about the Uncanny Valley. Did Realdolls, considered by many as the most desirable sexdolls in the world, escape the Uncanny Valley because they were inert? If so, what would happen when they became roboticized? Would their attempts at acting human make them less desirable and/or interfere with the kinds of fantasies projected onto them by the men who bought them? Indeed, to what extent was fantasy and projection integral to the purpose of owning a Realdoll and to what extent was the doll but an intermediary step in a longed-for reality for robot companions that were indistinguishable from humans? These were some of the questions that eventually inspired *The Mechanical Bride.*

While I was shooting the documentary, I was also working on a PhD in critical film/media theory and had just begun research for a doctoral dissertation on representations of artificial bodies in film, literature, and art.[2] My intention was to bring the two projects together in some form, especially in relation to ideas around the uncanny, but they remained inexorably and frustratingly delinked. Although the first cut of the documentary featured twenty minutes of footage explaining the importance of the Uncanny Valley for understanding the robotics industry at the time, that section was eventually cut after viewers in a number of test screenings said they found it less clarifying than confusing (the Uncanny Valley had not yet filtered into popular culture). I also found it difficult to discuss the subjects of my documentary in my dissertation and to relate them to the filmic and literary representations of female robots I was analyzing. This was, in part, because the scholarship around film/media *representations* of robots, at the time, had little explanatory power for what I was experiencing out "in the field."

The two projects did, however, inform one another: the documentary provided real-world experiences against which to test the assertions of the dissertation, and the dissertation provided a means of articulating some of the unspoken theoretical underpinnings of the documentary. Moreover, the difficulties that I had at their integration gave rise to one of the most significant takeaways of my various endeavors around artificial companionship: the importance of parsing the distinctions between artificial bodies in theory, in practice, and in visual culture. I came to understand that an artificial companion is one thing in private relation to her/his owner, another when represented in the media—whether in my documentary or a film like *Love Object*—and still another as a literary or theoretical subject. It is only by thinking through these various experiential registers that we can begin to grasp the nuanced intricacies of uncanniness—both the pleasures and unpleasures—in our relationships with artificial bodies.

2 See de Fren 2008.

Such distinctions were, in fact, of concern to the earliest theorists of the uncanny, physician Ernst Jentsch (1906) in his essay, "On the Psychology of the Uncanny" and psychoanalyst Sigmund Freud (1953–74a) in his essay, "The Uncanny." While both make reference to the 1816 short story "The Sandman" (Der Sandmann) by E.T.A. Hoffmann (1967), in which a young man unwittingly falls in love with a mechanical doll, each acknowledges the differences between the real and the representational in elaborating his interests and opinions. Jentsch is interested in the aesthetics of the uncanny and, in particular, how something frightening in real life can become a source of pleasure within art—including literature and theater. For Jentsch, the mechanical doll Olympia in Hoffmann's story is an example nonpareil of this phenomenon, since her uncanny indeterminacy is a source of vicarious enjoyment for readers (as well as viewers of the operatic and balletic adaptations of the story) while, in reality, there is no more potent source of uncanny displeasure than "doubt as to whether an apparently living being is animate and, conversely, doubt as to whether a lifeless object may not in fact be animate" (Jentsch 1906: 11).

For Freud, on the other hand, the mystery surrounding Olympia is of less interest as a source of uncanny effects than the theme of the Sandman, a mythological figure who steals the eyes of bad children while they're sleeping, and whose image haunts the protagonist, Nathanael, in different forms throughout the story. While Freud concedes that Olympia is uncanny, he suggests that the animation of an inanimate doll holds no more psychological interest than any other fantastic or supernatural event. Moreover, unlike Jentsch, Freud is not interested in Hoffmann's story for its aesthetic pleasures, but rather as an illustration of a psychological drive that lays beyond the pleasure principle, which he calls the "death instinct" and links to repetition compulsion. Indeed, his elaboration of this drive in the book *Beyond the Pleasure Principle* (Freud 1953-74b) was the impetus for his essay "On the Uncanny"—the latter was written between drafts of the former and published the year before. In the book, he states early on that while the enjoyment derived from "painful experiences" in the theater or art hints at that which he is addressing, they "are of no use for our purposes, since they presuppose the existence and dominance of the pleasure principle; they give no evidence of the operation of tendencies beyond the pleasure principle, that is, of tendencies more primitive than it and independent of it" (Freud 1953-74a: 17). Uncanniness is, for Freud, marked by a return of repressed infantile complexes or amputated aspects of self that are buried in the unconscious. The compulsive nature of such experiences, which Freud suggests override the pleasure principle, is better represented by the imaginary Sandman, who inspires revulsion and fear in Nathanael in every form in which he is repeated, than by Olympia, whose mechanical movements, however much they hint at the "death instinct" lurking beneath Eros, are marked by a vacillation between life and death, beauty and its shadow, which is experienced by Nathanael (and the reader/viewer) as both compelling and strangely pleasurable.

FIG. 2
REALDOLL

In short: Freud is interested in that which drives the fictional Nathanael mad, discussing his case as he might that of an analysand, while Jentsch is more interested in the psychological experience of the audience watching at a remove Nathanael's interactions with the mechanical Olympia. Taken together, however, they demonstrate the complex entanglement of fantasy, reality, and psychology in considerations of the uncanny. Thinking through such entanglements became important in the course of making my documentary, as I journeyed into a world where all three were at play, and where I experienced repeatedly uncanny bodies that were horrifying for some, desirable for others and, for still others, fascinating in the ambivalences they produced. Indeed, one gets a sense of all three in relation to the doll owners in my documentary.

All of the sexdoll owners I interviewed spoke about their doll(s) in highly idealistic terms, as if their dream girl(s) had become a reality. This idealization is encouraged in the ordering process: most dolls are ordered piecemeal (head type, body type, hair color, etc.) so that they are constructed to the exact contours of their owners' desires. Such imagineering—although directed at a precise material outcome—also encourages generative fantasies that get played out even before the dolls arrive, and that are sustained long after.

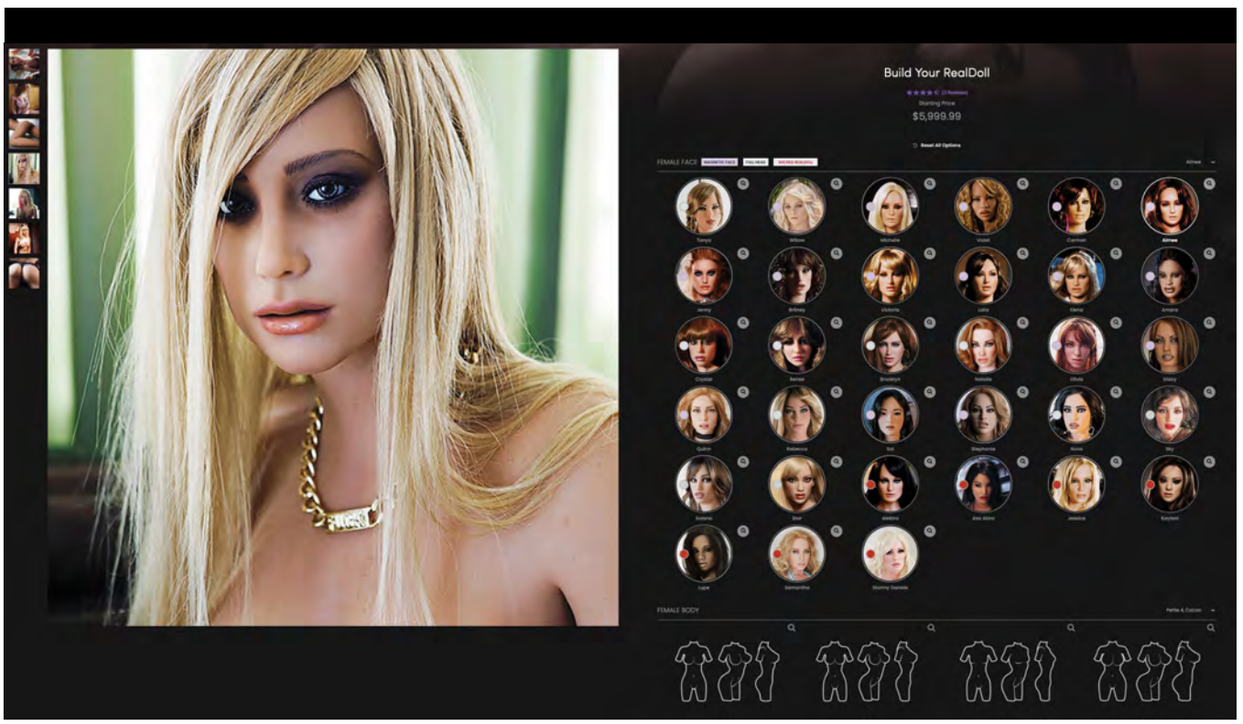

FIG. 3
BUILD YOUR *REALDOLL*

There is, however, for anyone experiencing the dolls at close range, a notable discordance between their owners' descriptions and the stark reality—the dead weight, immobility, and vacant stares; the degraded silicone around the eyes, mouths, and joints of older dolls; hair and fingernails that had been rendered askew through repetitive use. The exterior reality—however obsessively tailored—seems to fade from view as the dolls become emotionally and libidinally cathected. While such relations generally happen in private, once made public, the contrast between the subjective experience of the dolls as desirable and their objective undesirability for all others can become a source of curiosity, pathos, horror, and even humor, depending on how it is framed.

E.T.A. Hoffmann was far ahead of his time in contemplating the inherent drama of the subjective/objective split in human/non-human interactions. He was writing at a time when human automata were touring Europe, and his stories involving mechanical humans were most certainly inspired by his first-hand impressions, which were by all accounts not favorable. He rightly intuited, however, the dramatic and critical possibilities in stories of artificial love. In "The Sandman," the awkward encounters in which the enamored

Nathanael attempts to woo the stiff and taciturn Olympia to the horror of his friends and the intrigue of the story's readers, anticipates similar scenarios in films ranging from *Metropolis* (1927) to *The Stepford Wives* (1975; remade 2004) to Fellini's *Casanova* (1976) to *Lars and the Real Girl* (2007). Within these works, scenarios that might otherwise play out as a typical erotic or romantic encounter are defamiliarized by the insertion of an artificial body. In the process, they draw attention to the constructedness—indeed, to the cultural and social programming—involved in acts of love, sex, and romance, raising intriguing questions about human agency.

Such moments of derealization are not only thought provoking and entertaining, but also potentially erotic, as I discovered after meeting a subculture of robot fetishists. I have written at length elsewhere about this fetish subculture, whose members call it A.S.F.R. (alt.sex.fetish.robots) after the internet newsgroup where they originally congregated online (see de Fren 2009). What is worth reiterating here is their unabashed attraction for uncanny scenarios. As an example, although most ASFRians (as they call themselves) love the film, *The Stepford Wives,* their interests reside less in the idea of the perfect robotic housewife than in those uncanny scenes in which the wives malfunction or get caught in a repeat loop, scenes beneath which forboding music plays and that are intended to evoke horror. These are moments of vertiginous rupture that not only offer a glimpse of the robotic programming beneath the ideal exterior of the Wives, but that also throw into relief the cultural norms through which such ideals are constructed. Indeed, in the film, such scenes serve as feminist commentary on the extent to which real women (and men) have been socially programmed. Such moments of robotic unmasking and defamiliarization recall, of course, the climactic scene in *The Sandman,* when Olympia's eyes are removed and she is revealed as a mechanical doll to Nathanael. It is just such scenes that are uploaded and played repeatedly on their websites by ASFRians for their own erotic pleasure.

FIG. 4
DETAILS OF *REALDOLL*

Although human-looking dolls and robots are, since the time I made my documentary, increasingly in development and the news, they remain liminal figures existing somewhere between the human and non-human, fantasy and reality, subjective and objective experience. The extent to which such humanoid creations produce uncanny effects is often dependent on where they fall along these continuums, but also their creators' intentions. Rather than approach the Uncanny Valley as a hurdle to be avoided at all costs, it would serve us well to amble its many footpaths in curious exploration of its aesthetic and critical possibilities.

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THE MECHANICAL BRIDE. REALDOLLS AS *COMPANIONS* AND ACCESSIBLE OBJECTS

MARTINA HEßLER, JÖRG STERNAGEL

The Mechanical Bride is the title of a 2012 documentary about the use of sex dolls, more accurately of a particularly lifelike brand called RealDolls.[1] The dolls' designers and sellers also have their say and there is some discussion on the development of sex robots.

The documentary takes a clear position on the subject, as indicated by the title, taken from Marshall McLuhan's book, *The Mechanical Bride: Folklore* of *Industrial Man* (1951). McLuhan explored the link between technology and sexuality as well as the work put in by women to achieve a perfect body.

For the filmmakers, RealDolls are squarely in the tradition of the Pygmalion myth, the male desire since Antiquity to create and own a woman made after his own ideal. The accessibility of the dolls is touched upon, as well as the close emotional tie some men have to their dolls and the violence acted out upon the dolls that raises the ethical question of whether this is still violence against property or, because of their naturalistic design, something else. Particularly irritating are the moments that show men living emotional, intimate lives together with their RealDolls or discussing hate-filled aggressive violence against them.

The starting point of the film was a photographic study by Elena Dorfman and Elizabeth Alexandre compiled in the book *Still Lovers.* Published in 2005, it was the culmination of a documentary project started in 1999, shortly after the release of RealDolls in the mid-1990s. The photographs were exhibited in New York, Chicago, and elsewhere (Smith 2017: 227). Often, they portray intimate situations and emotional connection, for example RealDolls and their owners in day-to-day situations such as watching TV or sitting in the garden or at the dinner table.

Inspired by this book and by her previous job as a digital interaction designer, in *The Mechanical Bride,* de Fren delved into the relationships between the men and their RealDolls. At the time of production, she had already documented technofetishism, also a result of working with almost only male roboticists in a "future technology" think tank in Silicon Valley (De Fren 2009).

1 Allison de Fren, the film's director, is Associate Professor for Media Arts and Culture at Occidental College in Los Angeles Her research focuses on gender and technology as well as bodies and technology, in particular synthetic bodies. Even her dissertation was on the representation of artificial women since the Renaissance, see de Fren, *Exquisite Corpse.* She is currently a media practitioner and scholar.

The Mechanical Bride is not the only documentary on the subject of RealDolls and *Still Lovers* is not the only photographic documentation thereof. Sandra Hoyn's photo project *Jenny's Soul* documents a man's intimate relationship with his doll,[2] and the 2006 BBC documentary *Guys and Dolls* explores the same subject, to name just two examples.[3]

Starting from the photo book *Still Lovers* and the documentary *The Mechanical Bride* this essay first explores the question of emotional connection to RealDolls. This is followed by an analysis of the book, and one photo in particular, from a feminist perspective.

"HOW DOES ONE LOVE SOMETHING THAT IS NOT ALIVE?"[4]

Davecat is one of the documentary's main protagonists. He lives together with a RealDoll he has named Sh-Chan that he considers his "companion." He buys her clothes, make-up and jewelry and takes her to the park and to restaurants. He carries her picture in his wallet and his few friends know about and accept Sh-Chan. Davecat tells the filmmakers that he could imagine having a relationship with a "real" woman, but only if she accepted Sh-Chan. His ideal would be a ménage à trois with two people, a woman and a man, and a RealDoll. Another interviewee, an old, lonely, and sick man who dies during the making of the film, bought a doll that looked similar to his wife after she passed away. He lives with the doll in his small apartment and says that it makes him feel less lonely. Old and sick as he is, he doesn't believe he could subject another person to being with him. Another interviewee sees RealDolls purely as a sex object with which one can do things that are socially inappropriate and, more importantly, not acceptable to women. Eager not to be misunderstood, he stresses that he has nothing against feminism, but it's difficult because the male instinct is to control women. He even repeats "control them" twice to give it more weight. Another man talked about his violent against the dolls. He pulls out their limbs and, one could say, massacres them.

The film portrays a range of emotional responses to RealDolls, from intimate loving relationships in which the dolls become a partner to attempts to combat loneliness or compensate for loss to fantasies of control and power and excesses of violence and aggression. One could pathologize these cases and write them off as a marginal social phenomenon or as relationship problems of socially outcast, emotionally disturbed or lonely people. However the documentary asks a fundamental question about the relationship between humans and machines that, in light of developments in robotics and artificial intelligence, is extremely relevant and cannot be dismissed as a peripheral problem of a technified society: "How does one love something that is not alive?" This question is examined below from a historical perspective.

COMPANIONS, PARTNERS AND NEW RELATIONSHIP MODELS?

Sex robots have recently sparked a heated debate.[5] David Levy's (2017) provocative statement that love relationships with sex robots will be commonplace by 2050 is often cited. Interest in the topic is quickly confirmed by a look at media and the book market. Even the journal of the Bundeswehr, the German military, recently published an article on sex dolls, hi-tech sex toys, and sex robots (Blum 2017).

2 https://www.sandrahoyn.de/portfolio/jennys-soul/ (13.06.2019).

3 See https://www.youtube.com/watch?v=pxCkULUnVH0 (13.06.2019].

4 Elena Dorfman asks this question in the documentary, *The Mechanical Bride*. Smith (2017: 227ff.) also discusses it.

5 See for example Danaher, McArthur (2018). Also and in particular the Campaign Against Sex Robots: https://campaign-againstsexrobots.org/author/robotcampaign/ (15.06.2019) especially Kathleen Richardsen's feminist critique.

Historically, the question must be asked whether this is a new kind of human-machine relation or even a new relationship model altogether in which technological objects are elevated to relationship status. The men interviewed for *The Mechanical Bride* repeatedly stress that for them these dolls are partners or companions, a term also used by roboticists in discussions on the development of social robots. The film therefore poses the question of living together with artificial companions and hence a fundamental question about relationships to artificial Others, whereby the concept of the Other must be fundamentally questioned (Gunkel, Marcondes, Mersch 2016).

Historical research has not taken this question into consideration. The few studies that have been conducted on sex dolls are in the main interested in the cultural history of the tradition of the Pygmalion myth and so in the long continuity of the desire to create and own a perfect woman crafted after one's ideal. They reference the virtual creation of artificial women in cultural history; in literature and science fiction as well as in Kokoschka's images of Alma Mahler as a doll or in Hans Bellmar's erotic dolls (Wennerscheid 2019, Ferguson 2010, Smith 2013).

Historical reconstructions of the history of sex dolls also stress their function as a replacement for a missing human partner. The most plastic example is the "dame de voyage," considered to be the first sex doll, a woman made of old clothes meant to stand in for women on long sea voyages and ensure sexual hygiene (Ferguson 2010: 16f.).

With the emergence of the sex industry in the late nineteenth century, advertisements arose for sex dolls that clearly show that the key idea was to replace human but inaccessible female partners. With the advent of a sex industry, these puppets, as Marquard Smith (2013: 183) contends, must be seen in the context of mass production, commerce, and, most of all, consumption. This underlines the fact that these dolls are objects. In the late nineteenth century, sex dolls were advertised as a "perfect illusion of reality." (Ibid.: 185)

A look into history so reveals two connected lines of continuity, both of which are rooted in concepts of accessibility and objectness: the idea of the creation of the perfect woman made after one's own ideal and always at one's disposal, as well as technological replacements for inaccessible women. In the past, sex dolls were difficult to come buy. They could be bought in bordellos or porn theaters, later also in sex shops (ibid.: 191). Since the 1970s and '80s, blow-up dolls have been readily available. But even if sex dolls and artificial women have been a pop-culture topos since the 1970s, they still were considered "dirty."[6] It would have been unthinkable in the 1970s or 1980s to take one into a restaurant as the protagonist of *The Mechanical Bride* does.

RealDolls have been on the market since the 1990s, and the number of almost exclusively male customers has steadily risen (Ferguson 2010: 40f.). As Anthony Ferguson observed, "suddenly the sex doll was the in thing." (Ibid.: 3) On the one hand, this is a result of technological progress, with the development of new materials and their increased availability and with the increased ease of production of lifelike dolls. A second factor influencing this development is the internet, where aficionados of sex dolls come together and bolster one another in their attraction to these objects. A group of people arose who asserted themselves as "technosexuals." (Ibid.: 4) Finally, the web made the dolls more available and easier to buy. But there have also been societal changes that play an important role in the spread of sex dolls, such as a public discussion of sexuality and a greater acceptance of previously deviant forms of sexuality. Sherry Turkle has even been criticized for her critical positions on sex dolls and sex robots: "I was asked if my opposition to people marrying robots didn't put me in the same camp as those who oppose the marriage of lesbians or gay men." (Turkle 2010: 6) The journalist who interviewed her called this "species chauvinism." (Ibid.) On the one hand, this is in line with posthuman idea, but is also exhibits, as Turkle comments, an "openness to seeing computational objects as other minds." (Ibid.: 5)

Historical research on the history of sex dolls has not explored the possibility of intimate emotional relationships to them. It is important to note that it is only in recent decades that, due to the developments described above, there has been any debate at all

6 Machines that interact with humans and are capable of emotions have often been the subject of science fiction in both literature and film. The arc spans from *RUR* in the 1920s to Spielberg's movie *AI* in the 1980s to more recent movies such as *Ex Machina* or *Her*. There have also been many less successful movies that explore the subject, such as *Electric Dreams* by Steve Barron in 1984.

about RealDolls and the like as "artificial companions." Are sex dolls, as historical literature in the main contends, still primarily sex toys, surrogates for human partners or masturbation aids? Or are they, as in the documentary under discussion here, also companions and partners? Are machines being given a new emotional and social role in our societies?

There has long been research on emotional bonding to objects. But these have focused on the symbolic ascriptions given objects and their emotional functions, not examined things as partners. Many of the questions asked in research on material culture are also pertinent to digital objects such as social robots and lifelike sex dolls. At the same time, RealDolls and sex robots seem to have a status of their own. Recent theories such as agential realism and posthumanism strongly proclaim the obsolescence of classic lines of demarcation and of the dichotomies drawn in the human-object relationships. They declaim anthropocentric thought, demanding that forms of relationship should not be limited to human-human or human-animal. However it should be asked whether these normative theories provide an adequate description, or whether relationships are more complex and cannot simply be captured by the dichotomy constructed here between dual, demarcated categories on the one side and decentral, hybrid categories on the other.

Historically, the 1990s seem to mark a caesura where types and models of relationships diversified and all forms of relationships abounded: dual, mixed, hierarchical, equal, homogenous, and heterogeneous. This is the time in which RealDolls entered the market and Tamagotchis became accepted as digital pets, followed by Furby and Aibo. Today, robots stand behind hotel reception desks, and are planned to talk to residents of seniors' homes or provide information in shopping malls. Digital objects and deceptively lifelike dolls began to populate our social worlds in the 1990s, and new forms of relationships developed.

Neither RealDolls nor Tamagotchi ever became mass phenomena. They did not become widespread substitutes for human partners or living pets. Yet what did develop, it is safe to conclude, is a new relationship to machines that has gained legitimacy as an emotional bond. Sherry Turkle (2011: Part One) focuses on this caesura when she speaks of the "robotic moment." She has observed that with the development of social robots computers went from being an "instrument" to which one could be emotionally connected to becoming "companions." (Ibid.: 3–4) While discussions in the 1980s on whether computers can "really" think still saw them as tools and stressed their artificiality, there has been a massive shift in thinking (ibid.). For many people, it has become natural to accept emotional relationships to robots.

HISTORICAL DIFFERENTIATION: CONTINUITIES, DISCONTINUITIES, SHIFTS, AND INNOVATIONS

This must be narrowed down historically and also differentiated. When digital objects or so-called social robots are touted as companions or partners, then human-machine relations and their social role has changed. Yet this is not a "from-to" development in which instrumentalization is supplanted by partnership.

Rather we can observe continuities, shifts, and the emergence of new types of relationships, as well as a mix of all of the above in emotional relationships both between humans and machines as well as between humans.

Continuities and the emergence of new forms exist side by side. Particularly in the context of sex robots, some are still asking the question of whether it can be "real" love and "real" emotions, while others like Davecat, whose "love life" is shown in *The Mechanical Bride,* are already living that model with conviction.

ELIZA is another prominent example of continuities. As early as the 1960s, Joseph Weizenbaum (1978) was disturbed when his secretary began to communicate intensively with the program he had written to simulate a psychiatrist, even sending him out of the room to guarantee her privacy. That people enjoy communicating with machines and trust them, or are open to a new form of intimacy with machines was already made obvious by the example of ELIZA. And it has been a topic in pop culture and science fiction even longer.

We can also see clear continuities in the figure of accessibility. The "benefits" of sex dolls, their accessibility and compliance, was already touted in the early twentieth century as an advantage over human women. Dolls never become jealous or start a fight and: "they are always ready, always compliant."[7] Advertisements for sex dolls underlined this tractability, as well as the advantage of avoiding tiring or unpleasant social situations. Similar claims are made for twenty-first century sex dolls: RealDolls claim to be perfect for men who are shy, anti-social, or disabled. Furthermore, they do not need to be entertained and never get sick (Ferguson 2010: 47). David Levy (2007: 211) sees another central benefit of sex robots; they make it possible to avoid the "constraints" and complications of "more conventional sexual relationships." Robots also guarantee to be loyal partners who never stop loving "their" person (ibid.: 22). In the early twentieth century, owners could choose from different models, in the meantime, these dolls can be built to suit their owner's tastes. RealDolls and sex robots can be put together from modules with an array of body types, eyes, mouths, etc.

A further continuity is the ability to act out negative feelings. The entire palette of human emotions is mirrored in how people interact with sex dolls, as outlined in the discussion of *The Mechanical Bride* above. Sex dolls are tortured and mistreated. Newly opened robot bordellos report that their customers' lack of restraint is a bottomless pit of socially unaccepted practices. Recently, people have even developed "cathartic objects"; robots made for venting steam (Moorstedt 2019).

How people interact with the new digital Other all too clearly mirrors the abreaction and bolstering of emotional behaviors, desires, and ideals that have long existed, but now are intensified in the context of technologization. They can be acted on unimpeded and are partly also accepted. The digital Other should thus be seen in a long continuity of human emotions. It is necessary to pose more nuanced questions about which emotional behaviors is strengthened through the use of digital objects and which are not, for example tolerance of non-compliance or of the idiosyncrasies of the Other.

Descriptions by the owners of RealDolls themselves reveal interesting insights into questions of change, the novelty of relationship models, and the status of RealDolls.[8] Almost all of them say that their relationship to the doll is emotional. Some of them report that this emotionality developed over the course of time because they had to take care of and repair the dolls and because they got used to them being around. They gave them names. Some said they would be very lonely without the dolls; others explained, that they were glad to have a silent doll around after an exhausting and communicative day at work. One man said the doll owned him, not the other way around. It should however be stressed that doll owners, asked their opinion on David Levy's prognosis that humans would be falling in love with robots by 2050, answered that this was neither possible nor desirable. They saw a clear division between loving a human being and the emotion they felt for their dolls, and never forgot that they were dolls (Ferguson 2010: 114–120).

That makes it clear that relationship to digital or artificial Others must be considered as unlike human-human relationships, but nevertheless as a new form of relationship. It should however be asked whether this is as easy to differentiate as two distinct types of emotion on the affective levels as it is on the cognitive level.[9] For recent studies make it abundantly clear that humans are quick to anthropomorphize robots. In one vivid

7 Bloch, *The Sexual Life of Our Time,* cited in Ferguson (2010: 17).

8 There have to date been very few empirical surveys on how people deal with RealDolls or the first sex robots, but the few that exist are illuminating. See here for example Ferguson's heuristic survey in a doll forum (2010: 114–120), and Scheutz and Arnold (2018: 247-260). The former is a survey of users, the latter of attitudes towards and appraisal of sex robots among the general public.

9 Turkle (2011) gives many examples that suggest that cognitive knowledge does not affect emotionality.

example from 2014, two Canadian scientists developed a robot, Hitchbot, to test whether robots could trust humans. Hitchbot grew a devoted fan base, that treated him like a friend. The bot could hold simple conversations, take photos, and post on Facebook and Twitter. It hitched first through Canada and then through Germany. Hitchbot could not move autonomously, but only with the help of humans, and obliging humans who offered a lift were always found. But one day, on a further tour through the USA, Hitchbot was irreparably damaged by "vandals," as the press scandalized. However, such anthropomorphizing of technology is not a new historical phenomenon.

What is new, is this type of collective empathy with a robot and the broad interest of the press. Certainly the technical development of seemingly being able to "answer" plays a role, or the interaction with robots that is perceived as dialogical, because they react, look at their human partners and even sometimes recognize them, quasi relating to them. The above is also true for sex robots in contrast to conventional sex dolls. But even the RealDolls of the 1990s possessed a new quality of ostensible "realness" that changed the emotions of their users due to their weight (usually around fifty kilos) and their lifelike "skin." (Smith 2013: 241)

It cannot be overseen that new relationship models are currently developing that we must put into historical, cultural, ethical, and social perspective. Technology challenges existing concepts of relationships—to date thought of as being reciprocal—expanding and shifting them. RealDolls and sex robots, as well as the many other so-called social robots, force us to reexamine the question of what emotions are. These are complex questions. How should we characterize the emotions described? Are these historically novel feelings, or are they comparable to love for humans or animals? Is there a difference between cognitive differentiation and emotional connection? While human and machine thinking can be clearly differentiated, it is much more complicated to distinguish between the often attested "real" feelings for humans and simulated feelings for computers and robots.

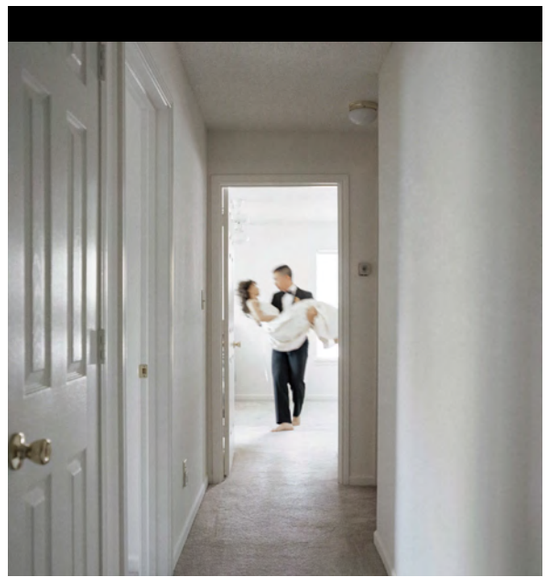

FIG. 1
DORFMAN, WEDDING PHOTO

STILL LOVERS?

The gaze is drawn to the image framed by the open door. Behind the opening, somewhat blurred, stands a man in a suit, a groom who is holding a woman in a wedding dress in his arms, his bride (Dorfman 2005: 17). It looks like he is getting ready to carry her over the threshold that marks a transition for both of them from one life to the next. In so doing, following a further meaning of this well-known and widespread patriarchal wedding custom, they leave evil spirits behind when entering the new world, a house protected by the man. However, the man in the photo is not holding a woman in his arms, his bride is not living, but mechanical—a synthetic, expressly non-human but rather technological Other. He is holding a doll in his arms. This is no ordinary doll, it is not a toy, or a tortoise collectible or a Barbie doll, but a life-size sex doll formed after a female ideal.

The photo is taken from a book entitled *Still Lovers,* the photos were taken during and influenced by a documentary shoot by Allison de Fren. The American photographer Elena Dorfman travelled the United States in and before 2005 with the French psychologist and journalist Elizabeth Alexandre visiting the mostly male owners of sex dolls, observing their daily lives, interviewing them, and photographing them together with their dolls. The first word of the title, *Still,* refers to both the fact that the *Lovers* have been caught in a still life, but also to the silence in the photo of the newlyweds, the pose they have taken, the woman in the arms of the man, frozen before crossing the threshold, their expressions

immovable. Are they still or silent lovers or are they still lovers now that they are married? The photo is the first of a series in the book that takes us over the threshold into the home of the supposed newlyweds in three further photos. The artificial bride is also photographed in profile in her wedding dress and wearing sunglasses. In the next photo, the bride and groom are shown hand in hand, their entwined hands are the focus of the image. In the fourth photo, this opening series ends on the bed. We see the doll lying there in her dress on her back, her hands are entwined, her left leg is falling of the bed, her left foot peeks out from behind the white hem.

The characteristic quality of these and the following images crystallized. Their framing and arrangement gives viewers a look into scenes that are familiar from our daily lives, but each is composed, given particular emphasis through Dorfman's use of color. Her stagings make it easy to see what otherwise is not visible at first glance. For the male owners, the dolls take the place of a woman that they believe belongs to them. She is therefore carried over the threshold, placed on a chair, and lain on the bed. She is prepared for these events; she is dressed, her make up and hair are done, and she is positioned accordingly. Dorfman follows each of these procedures, helps to create them, and presses the shutter release. In her preface, Dorfman tells about meeting the doll's groom. She got to know Peter through internet research and asked him whether he would be willing to be photographed together with his doll. Peter agreed and showed Dorfman his home. He presented his doll, to whom he had given the name "Azra" and whom he wanted to quickly marry before his real fiancée moved in and he then sold the doll as she had requested. His real fiancé, Peter said, did not mind that he owned and had sex with a doll, but she did not like that the doll would get neither fat nor old (Dorfman 2005: 4–5).

Dorfman expands on this first contact and first conversation to describe the meetings with doll owners that followed. From the moment the dolls were delivered and taken out of the packaging, they became foils for their owners' imaginations and were thus brought to life by them. The dolls were given names, biographies, and individual characters: Ginger-Brook, a lonely Californian woman who wants nothing to do with her family; CJ, an anchorwoman who reported the news every evening; Sidore, a troublemaking boarding school student who grew up in the suburbs of Tokyo and is now a Goth. Dorfman became a witness to these worlds, she visited them and wrote about them that they are not meant for the outside world, since the "relationships" that are manifested within them take place in the private sphere and behind closed doors. Dorfman was given a peek into what happens behind those doors, where ideals, phantasies, and desires are acted out. They are images of men dressing their dolls, caressing their breasts, reaching between their legs from behind in bed or ostensibly stimulating them while they sit in a chair. They are images of men living out their fantasies, ideals, and desires with one or more dolls, with or without the consent of their human partner.

When we look at Dorfman's stills or de Fren's moving pictures, are we, as the title of the book and the images selected suggest, looking at true lovers, even spouses? Can we, as Dorfman advances, speak of relationships that have developed between doll owner and doll? (Ibid.) The answer is no, since this is not love for another person. This is not about desire for a physical partner, through which a relationship can develop that feeds off consent and non-compliance and is characterized by mutual empathy, care, compassion, challenge, respect and critique and maybe culminates in marriage. It is also not about social life, where questions about the other person arise, about their otherness, their *alterity,* which is unavoidable in intimate relationships or in work relationships (Bedorf 2011). Others get in the way, they can hinder me or support me. I can try to get close to them or avoid them and I am responsible for them, as they are for me. It is not about any kind of being together that was chosen through mutual respect and that is constantly renegotiated; a companionship in which the Other is wife, lover, friend, companion, and partner. Rather, the aim is to eliminate any chance of mutual togetherness and to focus male desire only on that that does not, or better cannot, come from an Other, for dolls do not speak or act. They offer no resistance, because they are not human.

It is here that a feminist perspective begins, for it is clear that men can own these dolls and dominate them. Crossing the threshold with the doll in arm is therefore a movement towards ownership. It is an appropriating, controlling, and also violent movement, bolstered by the history of this custom. Its origins lie long before the banning of demons in the so-called Abduction of the Sabine Women shortly after the foundation of the state of Rom. Under Romulus, the Romans lured their neighbors into their city, inhabited predominantly by men, and then dragged the women over their thresholds and raped them to secure the future of their community.

The image discussed above is followed by many other images with other thresholds and transitions that make visible continuities in relations between the sexes. This is mirrored in the relationship to technology, also in the sense that no matter what the company or buyer says about sex dolls being harmless, or even fulfilling a social, therapeutic function, they continue to support beliefs about what men are due and what women are for (Murphy 2017). They underline that sex is something that men get from or do to women. Sex is not something two people can enjoy. It does not demand care, compassion, respect, or empathy. Accordingly, advocates of sex dolls describe "companionship" as a one way street for men—challenges, noncompliance, feelings, and ideas are not valuable or desirable qualities in a woman.

In this context, being together is solely about fulfilling men's desires. That is what the dolls are made for and they should be looked at from that perspective, for it is what motivated the creation process, which Alexandre developed in her essay for Dorfman's catalog, together with the men they visited. Creation begins with Adam who made Eve as a female "prototype" of his desire, as a "gynoid" or "fembot." But Eve is human and not synthetic, like Galatea, Pygmalion's ivory statue, modeled after a woman (Dorfman 2005: 9–11). Synthetic women offer men the perfect solution to feminist movements. It you won't submit to us, we will create women that will (Smith 2017). The ideal women is therefore, we can conclude, as always, *not* human (Murphy 2017).

Originally published in German: "The Mechanical Bride. RealDolls als companion und Objekt der Verfügbarkeit", in: Martina Heßler (Hg.), Technikemotionen, Paderborn: Ferdinand Schöningh, Reihe Geschichte der technischen Kultur, 2020, 369–384.

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PROMETHEAN SHAME? PANDORA REFRAMES: ELENA DORFMAN'S *ORIGIN OF THE NEW WORLD* OR, DIGITAL ARTS AND MATERIAL CRITICISM IN THE BREACH

JAMES TOBIAS

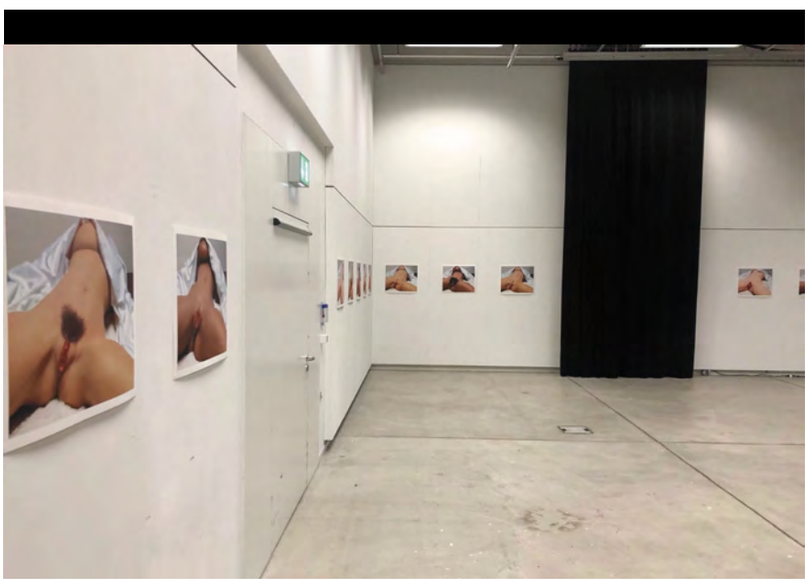

FIG. 1
ELENA DORFMAN, *ORIGIN OF THE NEW WORLD,* INSTALLATION VIEW, ZÜRICH UNIVERSITY OF THE ARTS, DECEMBER 2018

The digital prints line up across a wall, marching into and out of a corner of a common room in an arts university where a symposium has been taking place. The "V" shape of the march of images, in their seriated projection across the now extended corner of the room, suggests the perspectival vanishing point within each photographic scene whereby a triangle repeats: at the apex, above, a single breast; one thigh forms the lower left corner as it exits the frame; across the pudenda the third corner is formed by a knee at the lower right of the frame. Within each triangulated scene repeats an assemblage of silicon body parts—specifically, in the foreground, pudenda decorated with more or less fuzzy clouds of hair, and foreshortened, as each view is, to emphasize the vulva or penis modeled within each image, the variously sized single-breast reclining away from the viewer. Elena Dorfman's series *Origin of the New World* remodels and remakes Courbet's 1865 *Origin of the World* as a parade of factory-made, interchangeable silicone parts, artfully applied lighting and makeup, and digital framing and printing attached

simply, but also precisely, to two walls of the symposium space. One reaction I noticed was to feel vaguely aroused—you may choose the gender of your interest to fixate upon, but nevertheless, you don't commit, your eye wanders, one can't decide—but also neutral and neutralized at the same time, in a kind of grating tension, as if one had taken beta-blockers in order to enter a sex shop (one that happens to be particularly and unusually attentive to product spacing, print quality, and visual and spatial presentation) in order not to have to feel forced to react to the provocations of the products displayed there. Your reflexive positioning in the materialized, metered corner as it folds out into the symposium room—*that's* the reaction, it precedes you, and it follows you, and you know it. This is your work space.

On the far right of the right wall where the prints continue their march, and anchoring this complex assemblage of scene, space, and positioning, is a curtain. Behind this curtain, a lightbox is hung—as if, here, enshrouded and reserved for a brief moment of secret pleasure, we find the origin of this second coming—or perhaps its conclusion. You went behind the curtain, you found a mirrored surface, your own image looking back at you; turning on the machine's light, your face fades to be softly superimposed over another of the images of silicon pudenda. The sense given is that what might have been assembled as a scene of conversation between the viewer and the artwork, or of supplication, between the adorer and the divine, instead turns into a kind of demonstrative mismatch: your eyes, your nose, your face, but less visible than "her" lost modesty, her exposed breast, her disappeared face.

The disappearance is forced and it is double; first, Courbet's model (now thought to be dancer Constance Queniaux) is disappeared all over again, as she was in Courbet's work; but then, too, so is Courbet's rendering of Queniaux as faceless also, itself, disappeared. The violent double logic is made patent: your face only appears to you to the extent that hers disappears from "her body." No mistake about it, whether masculine-endowed or feminine-endowed or trans-endowed, these are objects whose strangeness has to do with their status not simply as objects but as tools, tools for seeing, seeing not simply into the image or its framing, but also the platform of knowledge-making on which the image is displayed. These images are instruments for viewing processes of feminization, racialization, sexing, upon the larger platform where the human is synthesized. So I refer to the body of the entire series in terms of feminization, as "her body"—but to be clear, this is a montage of bodies and occasions. I'm not referring, only, to female gender, or to processes of engendering. Feminization, racialization, sexing, and instrumentalization—not subjectification, not objectification, I think—is what Elena Dorfman's *Origin of the New World* makes patent. And there is violence captured and contained, demonstrated, made diagnosable, in each image, in the projection of the series into and out of the corner, across the walls, in the pseudo-privacy of the lightbox and its curtained scenarization—violence in the technical reduction of the raced, gendered body to silicon molding, to perspectival imaging, violence in the reduction of desire to fetish. If the photographs themselves are staged documents, they are also persuasive demonstrations, a balance of aesthetic experience and essayistic display.

So the putatively neuter space of academic research or aesthetic exhibition is revealed—lit up, we might say, as if in a flash—as a staging platform for the way in which aesthetic research can, in the form of an exhibition, prompt, even format, the preparation and presentation of scholarly exploration. And the space so designed makes clear the demands on contemporary academics to inform our work with understandings, if not theories, of power and of violence, specifically in relation to processes and projections of racialization and engendering and sexing. But this display also reveals the violence of the very notion of the public under which academics labor in the belief that at some appropriate point we must enter into the public, take part in a forum, mediate art and public in some impossibly ethical fashion. Impossible, because if violence informs the formation of knowledge, ethics is challenged to differentiate itself from a violence ethics must deny, or simply descend into or reveal its own violences. This dynamic is in part what scholarly engagement on the actor and the avatar reveals as needing to be taken into account.

And indeed when the symposium ended, and most of the scholars left, and the public entered, another kind of violence, violence carrying violent threat, came with it. As Nadja Ben Khelifa, one of the scholars who took part in the "Uncanny Valley" symposium around the square of tables across the way from the "V" of Elena Dorfman's witting, sensuous, engaged display of unwitting, unfeeling and unthinking yet technically precise pudenda, tells it, the violence captured and contained in Dorfman's work found its reflexive enactment in what was, this time, an *unfortunately* demonstrative encounter with the public.

A man entered the symposium and exhibition space, screaming in Swiss German. Surprised, and unaccustomed to the dialect, ben Khelifa asks what he is talking about, and informs him in no uncertain terms that she will not be shouted at in such a way. He insists that his "macho" behavior is to be allowed in this "common" space whether she likes it or not—and, well, here it is in a nutshell—a demonstration of the fact that the technological architecting of "the common" and the "shared" are premised on a properly violent disciplining of racialization, engendering, sexing.

Walking towards the man, ben Khelifa informs him that he is welcome to view the exhibition—and I wonder: perhaps he would learn to see that his own character is foreseen, formatted to be demonstrated in the "V" of marching, reclining, presenting pudenda, although perhaps not in such realistic or naturalistic ways. But, ben Khelifa makes clear, he can see the images, and he's not allowed to shout at her or intimidate her. With her approach, she aims to show the familiar stranger who feels strangely at home in the common space shared by artistic research and scholarly presentation that she won't be intimidated by his violent behavior or his implied violence. She thinks, though, that her voice, less confident, may be giving her away. The man tales a step towards the series of images—as if he might deface them, that is, might deface their demonstration of his own violent identity made visible as violence in the expanded "V" of Dorfman's cornered, silicon-molded, faceless and so sensate but non-sentient pudenda. Apparently his shame takes over for his rage; he fails, more an avatar of violent action to come than an actor of violence in the academic scene. Security is notified; the man, now a violent phantasm more than a violent act threatening violence, fades away into the halls of the academy of art. Ben Khelifa described this incident as a kind of *"Taxi Driver"* moment; reflecting that logic, we might see that the university, for the self-appointed arbiter of public discourse and public space, becomes a site of iniquity replacing the infested streets of New York City; that the subject to be saved by the pseudo-historical actor is an avatar of silicone and light; and that "the pimp" is somehow now supposed to be the scholar-curator guiding the public actor through the labyrinth of the technologically embodied present.

Obviously, there's more to be said about the powerful images that hung on those walls. The variations of their seriation deserves mention: a tiny phallus competes to replace a larger one at the wandering pleasure of the viewer; skin tones and volumes jostle in the feeling eye's redoubt as our bewildered look travels from image to image; pubic hair can seem clown-like in color or oddly mowed; the single breasts forming the apex of the visual triangle composing each image rise and fall as they repeat from one image to the next, as if in a natural evolutionary variation of the logistics of securing, pouring, and polishing silicone rubber. Of course the strange, sad, violent macho failed in his mission and had to run away—where would he even begin if his task was to restore masculine pseudo-integrity with such an overwhelming and productive series of projections put in play between actor and avatar in this space? How would one failed subject and their one sad body attain to the larger implications of racialized, engendering, sexing bodies diagrammed in Dorfman's corner of proliferating pudenda? The tiny cock makes the point: to demonstrate engendering, racializing, sexing in terms of instruments' relations to other instruments—where "ubiquitous instrumentality" is a speculative thesis suggesting test conditions for thinking about the way we imagine "technological being" "being everywhere"—is to demonstrate *lack* of development, immaturity, failed organization, incapacity, the neoteny of the avatar as social actor and of the social media subject.

But if, as Terry Winograd long ago observed, computers work almost by default as social actors, it's a complex contradiction in terms to speak of a "social media subject" — this contradiction is worth unpacking. While the avatar as a site of digitally mediated performance may be conceived in terms of contradictions of digital selfhood, it's important to point out that beyond the logistics of projecting, enacting, and archiving digital identity, avatar performance works not simply as mask but also as costume, and demonstrates a derealizing of embodiment as much as a logistics of managing identity. At stake in this derealization, too, seems to be a kind of shame at the sight of, and at the virtual touch of, a particular technological style of synthesizing the human. This shame might be "Promethean shame," but, indeed, to demonstrate Promethean shame in this fashion suggests an artful synthesis of aesthesis with ethical claim-making: here, artistic practice and critical praxis work together to counter the inculcation and indulgence of Promethean shame and the violences we can associate with it.

Günther Anders argued in his 1956 chapter "On Promethean Shame" (Anders 2016), part of his book "Die Antiquiertheit des Menschen", that the sheer advanced quality of modern technological objects produced a kind of existential shame in the contemporary human subject:

> *"When humans suffer from feelings of inferiority in the face of their* machines, *then they do so, primarily because they are forced to realize—in their attempt to measure up to their machines—that they are a 'poor quality' raw material when it comes to being moulded into this or that machine part. Instead of actually being raw material, humans are 'unblessed' morphologically because they are already pregiven. Moreover, every pregiven form turns out to be 'wrong' and 'already pressed into the wrong shape', because in each instance the actual form machines require varies. In 'human engineering" people attempt to 'melt down' this 'misshapen form' in order to retroactively source the material from which the required shape at any particular time can still be made" (Anders 2016: 51).*

Anders postulated "sexual shame" as the quintessential form of shame. Since shame as inability or failure means it is associated with negative intentionality, is beyond choice and freedom, is improper to the individual, more related to "the it" than to the subject proper, so shame has thus to do with a conflict between being a subject and being a thing. Since sex, for Anders, was pregiven, thought to underlie but be beyond intentionality, and connoted rather negative intentionality, the inferior and unblessed, for all these reasons "one's sex is a pudendum, (…) something of which one is ashamed" (ibid.: 67). With Promethean shame, though, Anders argues, we take account of another "it," that of the technological device. "We can, in a sense, picture the human — and this is now truly only an image — as clamped between two brackets, as if constrained by two forces that both challenge the 'self': on the one side the human is constrained by the 'natural it' (by the body, sex and species, and so forth) and on the other side by the 'artificial' (bureaucratic and technological) 'it of the technological device'. The space left open for the 'self' is [in 1956] getting smaller, while the danger that the 'self' is crushed by these two colossal non-individual forces is daily increasing" (ibid.: 76).

Some seventy years later, it is clear that both to the side of "body, sex and species" and also to the side of "bureaucratic and technological artifice" we must gain specificity by introducing "racializing," "engendering," and "sexing" descriptors; and that the cybernetic advance of Promethean shame now requires "the it" to be not simply "the machine" but also to be understood as involving the complex relation of machines to machines. A "ubiquitous instrumentality" discursively constitutes an improper and unrigorous surrogation of historical conditionality in too many accounts of avatarial action — as if networked machines could absorb into their calculating operations the disparate and discontinuous histories that produced them. Identifying and naming this false premise in this way is one way of revising

popular theories of Silicon Valley's supposedly cybernetic imaginary of avatars holding our place as we stumble into the merchandized technological future, and of re-thinking ideas about "the California ideology" as a kind of neoliberal symptom.

And this is where Dorfman's installation of *Origin of the New World* not only prompts and engages with critical discourse, not only distills a kind of iconoclastic platforming responding to and cutting off at its knees that form of iconomania whereby the images of celebrity, of governing authority, and of ubiquitous technological instrumentality seek to flourish and triumph in their unblessed, misbegotten wills to power. Dorfman's work says you can have it all now—all the racing, sexing, gendering you can consume—but you can't have any of it and remain visible to yourself as yourself. Still, her critical referencing of Courbet and the history of art also reminds us, you didn't have yourself as such to begin with. The result is a short circuit that leads to a breach, and there's no way out but forward in some non-continuous leap over the looming void. Aesthetic experience here forces critical engagement where the social actor and the networked avatar disappear into one another. We must invent another style of technological life.

FIG. 2
ELENA DORFMAN, *STILL LOVERS* (2001–04)

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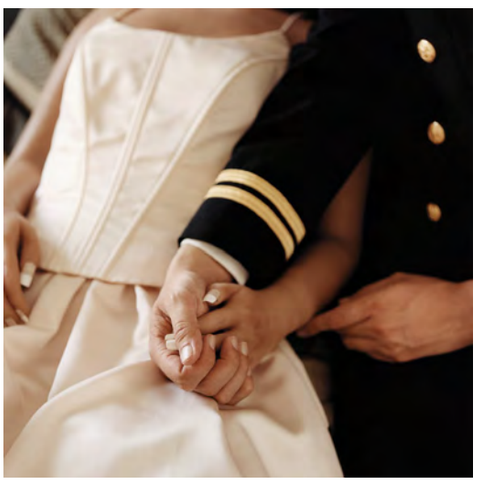
THE ARTIST'S STATEMENT

ELENA DORFMAN






STILL LOVERS (2001–04), IS A SERIES OF PHOTOGRAPHS THAT FOCUSES ON THE DOMESTIC LIVES OF MEN AND WOMEN WHO DEVOTE THEMSELVES TO LIFE-SIZE, ANATOMICALLY REALISTIC SEX DOLLS. THE PHOTOGRAPHS EXPLORE THE EMOTIONAL TIES BETWEEN HUMANS AND PERFECTLY FORMED SYNTHETIC WOMEN, FORCING US TO EVALUATE OUR OWN NOTIONS OF LOVE AND THE VALUE OF AN OBJECT THAT HAS THE POWER TO REPLACE A HUMAN BEING.

NEARLY TWENTY YEARS AFTER THESE PHOTOGRAPHS WERE FIRST PUBLISHED THE REAL DOLL FACTORY IS BUSIER THAN EVER TRYING TO MEET DEMAND, WITH THE UBIQUITY OF SEX DOLLS AND THEIR ADVANCEMENT INTO ROBOTICS; THEIR ACCEPTANCE AND POPULARITY RISING IN A WORLD WHERE INCEL MINDSET AND EXTENDED ISOLATION AS A RESULT OF THE GLOBAL PANDEMIC ARE ESCALATING.

STILL LOVERS SHED LIGHT ON A WAY OF LIFE THAT WAS CLOSETED AND MADE WHAT APPEARED DEVIANT MORE EMOTIONALLY ACCESSIBLE. NOW, MY INTERESTS ARE MORE INCLINED TOWARD WOMEN AND DOLLS AND THEIR GROWING SIMILARITIES. THE DOLLIFICATION OF WOMEN BY WAY OF ADVANCED INJECTION, SURGICAL ALTERATION AND CUSTOMIZATION AND A COMPULSION TOWARD UNIFORMITY OF FEATURES—WHAT LOOKS GOOD ON THE DOLL LOOKS GOOD ON THE WOMAN—AND VICE-VERSA. IN A RELATIVELY SHORT PERIOD OF TIME WHAT WAS ONCE CONSIDERED RADICAL—THE DE-AGING OF FACE AND BODY BY DECADES, MARRYING A HOLOGRAM, VISITING A DOLL BROTHEL ON THE WAY TO WORK—BARELY REGISTERS AS UNUSUAL AS MEDICAL, TECHNOLOGICAL, AND SOCIETAL NORMS CHANGE.

ENCOUNTERS OF THE UNCANNY KIND AT *THE ORIGIN OF THE NEW WORLD*

NADJA BEN KHELIFA

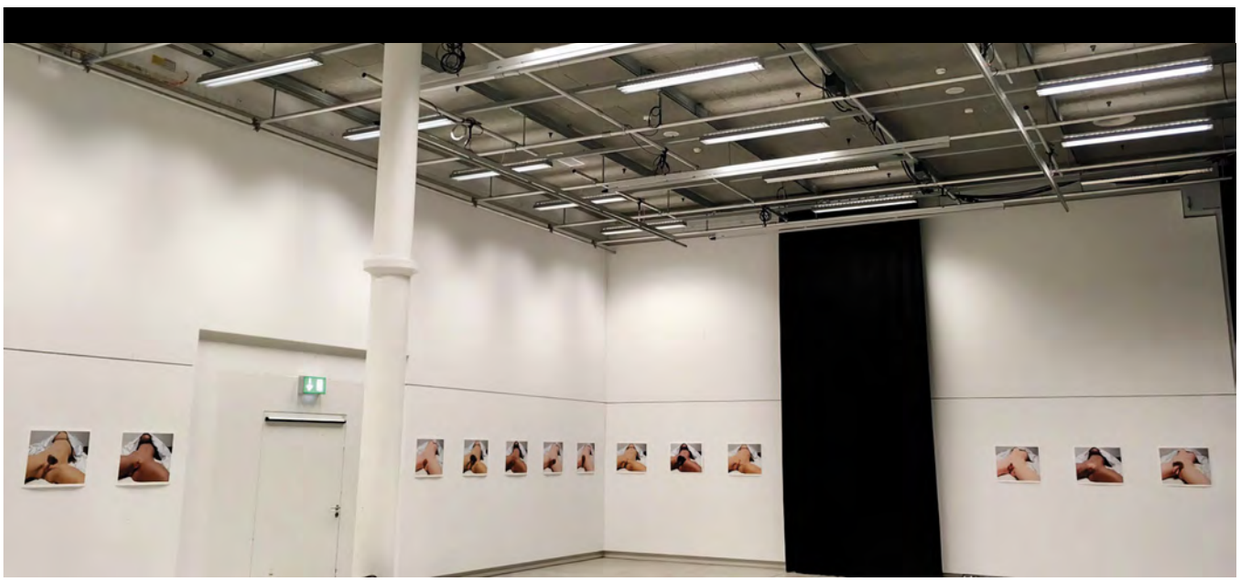
Since the age of Enlightenment, women have been systematically associated with nature, irrationality and the so-called "domestic sphere", men in a binary opposition with rationality, rational knowledge and public leadership. This is by no means an accident of history. Rather, the discourse of nature and the emerging shift of epistemological paradigms from mechanistic to physiologist and biologist approaches and the resulting humanistic anthropomorphism, which favoured the "human subject" of liberal humanist thought, rendered the hitherto relative and markedly socio-politically argued subjection of women since early modern times into an essential necessity, a truth, now based on women's irreducible "nature", by the middle of the 18th century. One could not have planned the construction and subjection of the category "female" more systematically thorough than the complementary developments in the areas of science, culture, law and politics suggested, which all fell into place under the new ideology of "nature". By contrast, the essential human subject was not defined by its body but by its mind, it was a rational coherent, autonomous, free agent (Hayles 1999: 85).

So, the general discourse of "nature" that was supposed to be the basis for the hard fought equality amongst humanity, in support of realizing the anthropocentric ideal of new concepts such as the universal human rights, precisely became the reason for the discrimination against and state of inequality of women due to their alleged "different" nature. The elevation of nature-based equality of human beings to become the universal norm, "naturalized" and therefore cemented the otherness of those who were deemed inequals by nature as "essential".

William Blackstone, the English legal theorist of the mid-18th century, notoriously wrote that "'[i]n marriage, wife and husband are legally one person, and that person is the husband.' Women just disappeared in all socially relevant ways after marriage […] their very being […] is suspended […]" (Steinbach 2004: 267): they were virtually disowned, had no say over their children, were legally viewed as minors and had no say over their own bodies. The charge of rape during marriage was legally non-existent as it was considered a contradiction in terms.

A century after Blackstone's words, at the time Gustave Courbet accepted the remittance work of painting "The Origin of the World" nothing had fundamentally changed about these conditions. If women were considered embodied nature, and giving birth their destiny, men's task, according to the rationalistic nature-ideology, was to dominate nature, outward and inward nature, and hence, not least of all, women. Therefore, Courbet's flaunting of his model's private parts on canvas was not at all a "feminist act" nor an act of feminism in order to free the "femme covert", but, on the contrary, the perpetuation of the fantasy of female domination by men with the means of pornographic art, commissioned, composed, and painted by a man, sold to several other people, one of whom again commissioned yet another man in order to create a cover up of the motif, in order to better control who may and may not see "her".

Today, even though the worst violations of women's rights by local laws and regulations are to be found in non-Western states, there are gruesome exceptions, e.g. the human rights violations by law with regard to transgender people.



EXHIBITION *THE ORIGIN OF THE NEW WORLD,* ELENA DORFMAN ZURICH, 2018

Moreover, examples of everyday culture show that the origins of the nature-discourse are still viable in Western societies for example in the widespread devaluation of knowledge of any kind generated by women working as writers on the internet, as artists or academics. The abject misogyny displayed in the digital realm is particularly staggering. Here, violent insults and death-threats are offered as "criticism" of the work of female writers especially female writers of colour and trans women writers. Sexualized violent fantasies center around the alleged site of "female destiny", the reproductive organs: they threaten "sterilization", "cut[ting] out the womb", and "rape", in order "to make her stop writing"; suggestions to "go be a stripper or a whore or just hang yourself", culminate in the judgement that the female writer is "subhuman".[1]

That the gendered identity of the creator of a work of art may play an important part in the public's willingness to accept their creation is suggested at the example of the replicas of Courbet's "The Origin of the World" in various media. At least statistically, creations by female artists seem to have been received more harshly and were cancelled more often, no matter the stance they took towards the original.[2] The continuity of constructing the essentialist "female destiny" by conflating woman and body in conjunction with the devaluation of "her" competency through violent fantasies that could very well be justified by the European Enlightenment's imperative of "nature domination" by the humanist subject is hard to miss.

1 Deutsche Welle, dw, The social media beauty cult, https://www.youtube.com/watch?v=5PBs7RqPTrI (01.10.2020)

2 Wiki, L'Origine du monde, the unofficial wiki list of works influenced by "The Origin of the World", online: https://en.wikipedia.org/wiki/L%-27Origine_du_monde (01.10.2020)

Patriarchal care and violence are the two sides of the same coin even in late 20th and 21st century Western cultures. Courbet's 19th-century work perpetuates an image of women according to 18th-century gender-roles into its time and further into our present. The woman depicted is an aestheticized body, manufactured and exposed in order to be admired and assaulted. Considering the ongoing support for the construction of binary gender in order to secure power for the liberal humanist subject, it becomes less surprising, that the critical sardonic treatment of Courbet's subject sparked outrage:

Elena Dorfman's exhibition, *The Origin of the New World,* provided a setting that commented on and refuted the very logic of Courbet's "natural order". Overseeing the exhibition, my encounter with one visitor, who still seemed to buy into the ideology of binary gendered power-relations turned out to be so self-consciously performative, that I neither saw it coming nor thought it possible that I would be able to witness an extreme uncanny reaction like that—all at once to the artwork, to the absent artist, and to myself—in an exhibition that took place in the framework of a workshop on "The Uncanny Valley".

For said middle-aged, male, white, and, judging from his vernacular, Swiss visitor, i.e. a self-evident "human subject", the circumstance that on this December morning in 2018 in the exhibition room "Aktionsraum" at the Zürcher Hochschule der Künste (Switzerland), contemporary photographer Dorfman's work was overseen by yet another woman, seemed to break the heteropatriarchal fantasy of women that he apparently and mistakenly expected to find on all levels of this exhibition, that featured a series of photographic replica, unfamiliarizing Courbet's painting. In a sense, the visitor made an honest mistake, considering that the 19th century artist's painting reaffirms the nature-ideology and arguably violently objectifies the female body as the epitome of "her" gendered identity—in popular culture comparable, perhaps, only to Alfred Hitchcock's fantasy in *Psycho* (1960)—and therefore must have been disappointed by Dorfman's replicas, which re-appropriate the representation of gendered bodies as markedly "unessential".

The visit was short, even if not a moment too short, and accompanied all the way by an outburst of his, provoked only by the highly intended wrecking of the visitor's gender-fantasy by Dorfman's work. I was the only other person in the room, so he made an, albeit stupid and ultimately unsuccessful, attempt at reinstalling the "due" gendered power-relations in this setting. On entering the room, he took some quick steps towards the photographs, looked at them, then yelled at me something unintelligible in Swiss-German while pacing agitatedly, aimlessly and too quickly through the room waving his arms uncontrolled. I asked him what he said in German and he screamed, "Did you do this?", looking at me and stretching out his arm like an arrow pointing in the direction of the photographs arranged on two adjoining walls of the room. I replied in the negative and that there was no need to scream at me. Then he yelled, angrily sneering at me: "You don't seem to like my macho-behaviour, do you?" And whether 'I thought that it all belonged to me', reminding me that "this is still a common room." Not quite sure what was going on, I told him that he cannot scream at me, and asked him whether he belonged to the university. He walked towards me, and menacingly said "What did you say? What did you say?" I walked towards him as well to show him I will not be intimidated, although my voice probably gave away that I did not feel terribly confident when I told him that he was 'welcome to watch the exhibition and then leave', but that he 'could not speak to me any longer.' I got my smartphone, and pretended to do something with it. He paused, made some jumpy steps towards the photographs for a moment and then, quickly and for once focussed, left the room. I was slowly but visibly following him out on the platform in front of the "Aktionsraum", pretending to be ready to make a call, while watching where he went. He nervously turned around a few times while making his way further through the building. I notified security immediately.

Why would looking at Dorfman's photographs aggravate the visitor? "Did you do that?" His fantasy-bubble burst in the moment he approached the photographs more closely and was confronted with the artificiality of the replicas of the exposed female genitalia in

a doll, marked by the visible staples. His moment of the uncanny valley, the shattering of a fantasy, even a betrayal turned the exhibition into a performance, whose clash of rules was anticipated in the laboratory setting of the exhibition, which challenged the visitor.

The uncanny is the realization of having been betrayed. Something that from afar looks familiar, like a person, changes upon closer inspection into something not quite "genuine" or "authentically" "human" according to the observers expectations.

This sense of having one's expectations disappointed or even of being betrayed runs deeper than an optical illusion or a sensory disorientation such as the dismantling of the visual illusion about merely humanoid body parts that were formerly mistakenly perceived as "human", guided by one's expectations. Rather, this disappointment is a betrayal of the second order, a debunking of another illusion that goes with the first one — here, a betrayal of the human subject's privileged expectation — that the Western cultural hierarchy of binary sexes and gendered power-relations is still in place, everywhere and self-evidently, namely the well-practiced visual and political hierarchy of the available female body and the (male) onlooker, as theorized in Laura Mulvey's often cited "male gaze" and Michel Foucault's "eye of power" that produces and establishes a "visual sovereignty" over the "genital body" in the first place (see Uparella 2018).

Courbet's painting demonstrated this availability in abundance, curtailing the female body to his liking; in the absence of a head, arms, legs below the upper thighs any form of agency is denied. The naturalistic depiction of torso and vulva are exposed to the penetrating gaze of the viewer — violence unpierced by irony. The ideological context constitutes the enabling rationale: the complete conflation of the female body with the social identity and destiny of women due to the nature-discourse in the liberal humanist tradition.

The visitor's disappointment with Dorfman's photographs then, stems from their withdrawal from the nature-discourse. The photographs are not in line with traditional representations of the female body. The refusal to supply an ontological basis for the representation of gender builds up a resistance towards the viewer.

The Uncanny Valley model is linked to the nature-ideology since it features both, an implicit, undisclosed human subject and others; without them, however, the model would not generate the outcome that Mori depicted as robust and therefore as the basis for his claim that the UV-model could help in telling apart human beings from robots. Mori claimed the UV-model in robotics would help to define the human being. *The* human being that is envisioned by Mori to perceive the uncanny is, however, not without presuppositions. Considering its own unthinking assumptions about the human being, the UV-model rather generates the outcome it inserts in the first place, in other words: it does not merely *tell* who is a human being but it works on the perpetual *making* of the human being. Mori's findings indicated a binary between a healthy human being and a human being with prostheses: Whereas the former *never* generates an uncanny reaction, the latter *always* does. It seems, the mechanism of the UV-model unthinkingly implies aspects of the life-world of the perceiving subject, to exclusively fit a "healthy human": The model implies the experiences and social settings of a "healthy human" as default, which is constitutive for what is perceived as uncanny in the first place.

Considering the model's intersubjective setting, it is highly unlikely that someone with a prostheses would react "uncannily" towards the unexpected encounter with a person who has a prostheses as well. Inferring from this, Mori's UV-model, informed by European theorists from the 18th and 19th centuries, constructed a perceiving human subject that is presented as "universal" but that, much like the human subject in humanism, is defined by its tacit presuppositions. Insofar, the UV-model is a marker of perceived personal and socially institutionalized alterity, that renders distinctions *within* the species of human being — not in-between the human and the technological other — on the basis of personal familiarity. Therefore, it perpetuates the presuppositions of this setting, and renders them visible, rather than generating *new* findings. This is the rendering visible of extant discriminatory distinctions between the "human subject" and "non-human people" (Morton 2017).

The outrage over female agency was twofold: "Did you do this?" I did not, but Dorfman did: she took back the representation of women from the remnants of 19th century hetero-patriarchy that still affect women's lives today, and — intricately linked — she rejected the hegemony over the construction of gender that is utilized in order to exert power over those people who are irreducibly excluded from the category of human subject in liberal humanism. By re-appropriating Courbet's artistic subject, female artist Elena Dorfman's rendering destroyed the purely heteronormative perverse fantasy of the availability of the "embodied female" devoid of agency, a maimed "genital body" depicted in Courbet's original, and turned it into a gender-fluid fair of, an — on closer inspection obviously — artificial figurative assembly, that makes light of body parts as spare parts with obvious seams and staples comprising an array of artificially coloured pubic weaves, as well as vulvas, breasts and penises in various shapes, sizes and skin-tones, which are mixed and matched like the sterile custom-fit industrial set-up on a website for the interior design of a car. The traditional view of binary normative gender categories that function as essential and therefore stable categories of identity is undermined. Thus, any power-relations depending on the stability and binary of sex and gender let alone gender-relations is presented by Dorfman as all, irreducibly constructed, illegitimate and doomed to fail. As a result, the preconditions for the Enlightenment idea of the "full human subject" are delegitimized.

Why would he refer to himself as "macho"? The then recent discussions in the wake of the semi-global "Me too" movement have obviously familiarized him at least superficially with the reality of issues around the objectification and abuse of as well as the discrimination against women, which he - also in line with the still mostly gendered roles of perpetrator and victim - has already lived up to in advance by acting as if he was personally charged with something ("You don't seem to like my *macho*-behaviour, do you?") and had to defend himself against all, the resistance of the photographs that announce the invalidity of the heteropatriarchal world view, against my refusal to act in accordance with my gendered "destiny" as a foreign woman, and against the rejection by the whole exhibition that he as the "human subject" is in power, including especially the power of artistic interpretation, of what can and cannot be exhibited: "Did you do that?" Curiously, precisely by acting out this "wrongfully accused male" perpetrator-fantasy in his performance, he enacted his abusive fantasy for real in the first place and directed it towards me. He enacted a backlash against his and like-minded people's delusion that allegedly women have "taken over" ("You think this all belongs to you, right?"), which is reminiscent of the fear of losing those socio-economic and legal privileges most white men have been accustomed to for centuries at the expense of women's and PoCs rights and freedoms.

This is nothing rare either, since the cycle of inadvertent actual "machismo" while making the case against (or rather whining about) being unfairly held in contempt for the sins of a few other (white) males who (tried to) abuse(d) their position of privilege "for real" is far spread.

The encounter with an uncanny being is described by Morton (2017: 134) as something that is in the same category with encountering an "abject", "unclean" being. Typically, the aim is to get rid of it, through the exertion of violence. In patriarchal societies and cultures women's bodies have traditionally been considered abject; the resulting violence against them was justified by the imperative of the domination of nature. "We make beings extermination-ready by designating them as uncanny" (ibid.). The intended speciism of the Uncanny Valley (humans vs technological others) needs to dehumanize people, constructing them as non-human people in order to make a clearer distinction between the species (Morton 2017: 135) which benefits the doctrine of the hegemony of the autonomous liberal human subject. So, at the lowest point of the uncanny valley, we then find all kinds of "othered" people according to all structural discriminations we can think of: sexism and gendering, racism, anti-semitism and ableism.

"You don't own this": this final remarkable meaning points to the core of the matter. How can he, a Swiss man be subject to the rules of an-other that is neither male nor Swiss?

It is about ownership of place and hegemony of interpretation. He caught me red-handed while I tried to get away with something, namely changing, albeit indirectly, the order of how things are done. He would not let me "sneak by".

The uncanny is first and foremost a judgment that there is something fundamentally "other" that tried to pass, to sneak by the detector which singles out the uncanny. The sense of uncanniness marks the detection of a betrayal which speaks to an intrinsic entitlement of that perceiving subject. Whether a perceiver is considered a human subject themselves or not, is the most important precondition for sensing uncanniness in another in the first place. The assurance of belonging, that resides as self-evident in the human subject, is insurance that they are considered the human norm and that the object that sparks uncanniness may be not. The Uncanny Valley unthinkingly became a normative model, in place to detect differences from the norm. Therefore, the UV merely measures violations of a society's social norms, an effect that is exacerbated or diminished by the respective individual's own experiences and horizons. Thus, the uncanny effect detects anything that is considered a deviation from the normative subject. "Disability" and "gender" are merely two of the triggers of the uncanny, if we consider Western culture as an indicator of who is fully considered a human being.

If an uncanny reaction is a reaction of extreme negative surprise and the feeling of betrayal towards a being that tried to "sneak by", to "pass" as human (= healthy, human subject), and if further the reference for what is such a full human being are the traditions of a societies culture and history, it is no wonder that not all genders are included in the idea of "human". A woman's body, e.g. is still considered in some fields a deficient male body, as exemplified by the gender data-gap in medical research.

Against the backdrop of a heteropatriarchal attitude steeped in the ideology of a naturalized order, a "symbolic revulsion" (Ben-Ze'ev 2018: 207) towards everything that deviates from such norms, certainly against Dorfman's photographs that invoke transsexual and intersex contexts and dismantle the normativity of binary gender, could activate an uncanny reaction in the respective human subject if representations of the fluidity and plurality of sex and gender as well as non-heteronormativity are perceived as "unnatural and non-human" (ibid.).

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FACE FRACKING

ANTON REY

FIG. 1
BERTOLT BRECHT
PHOTO: PAUL HAMANN

> *"God hath given you one face and you make yourselves another."*
> *Shakespeare,* Hamlet

Imagine you wake up after a bad night with little sleep, facing shortly ahead an extremely important video conference. The mirror tells you that this is not a winner's look, you have to do something about it.

Imagine you recall last Sunday's face you recorded, when you were in best of moods, well rested and with persuading looks. A semicircle with your phone-camera around the happy visage was perfectly enough, and now the registered mesh fits fine for the upcoming meeting. Nobody will notice any fake since you are speaking in real time with not a split second of delay. Your opposite will never remark any difference, even with the best will in the world. The screened face comes in perfectly true appearance with an original voice and live reactions. Bright smile, perfect performance and a convincing presentation of yourself.

> *Berowne: "Now fair befall your mask!"*
> *Rosaline: "Fair fall the face it covers!"*
> *Shakespeare,* Love's Labours's Lost

The face marks identity and variability of the same. What we project into a face is often our idea of what might hide behind it—or, more generally and seen from both sides of the surface: what we presume lies on the other side of the mask. Just as the Greek term "pros-opon" for face stands for the seen face, the visage open to my eyes, while the Roman "per-sona" means the sounding through the mask, referring to the source behind it (Belting 2013: 65). So what happens when digital transformation can manipulate our perception? When faces on screens, be it computer, TV or smartphone, just like synchronized voices, can be assigned to any person's head? (Castillo, Legde, Cunningham 2018).

In 2019, we planned to develop a method for producing and deciphering facial recognition. For this purpose, we proposed to join the expertise of the two most competent types of "facial counterfeiter": actors and programmers. We called the project "Face Fracking" and wanted to produce paradigmatic mediated faces in order to device a set of features that create a sense of and for authenticity. We wanted to investigate in the variations of actability (Bespielbarkeit) of others and make digital transformations of human faces recognizable

and trustworthy. Actors and programmers in a combined expertise to explore how false appearances could be revealed as false appearances, criteria for the transparency of digitally transformed faciality.

Given the ubiquitous presence of mediated faces one may rightly ask oneself to what degree the portrait *(Das Konterfei)* may be a counterfeit *(Fälschung).* The digital mediation of appearance on screens such as monitors and digital displays makes it possible nowadays to cheat and to replace any face with any other or by an avatar, an Animoji (Zell, Aliaga, Jarabo, Zibrek, Gutierrez, McDonnell, Botsch 2015). This is no longer limited to still images but is also possible in real time for video conferences, skype and zoom and other meetings, WhatsApp chats etc. We no longer have any certainty of who is there on the other side of our display. Sixty years ago, Erving Goffman began his groundbreaking publication *The Presentation of Self in Everyday Life* with Chapter One *PERFORMANCES. Belief in the Part One is Playing* (Goffman 1959). Today we have strong reasons to treat any digitally mediated likeness with suspicion. Even familiar faces are no longer trustworthy.

On the other side, when Benedict Cumberbatch is performing MoCap as Smaug for the film *The Hobbit,* when Andy Serkis performs Gollum for *The Lord of the Rings* trilogy (Jackson [director] 2001–3, 2012–14), the digital characters are instantly recognizable as avatars of the actors. Why? How does one detect this uniqueness? Are there any objective criteria? To what degree is there a singularity distillable? (With/Kaiser/Wehrle 2011)

> ***That's all one; you shall play it in a mask, and you may speak as small as you will.***
> *Shakespeare,* A Midsummer Night's Dream

"What's the best method for determining whether or not someone is trustworthy? Given the choice, should we trust a thorough background check, a polygraph, or a simple gut-check?", asked the Intelligence Advanced Research Projects Activity (IARPA) in "an era when the trustworthiness of the media, public figures and more is increasingly fraught".[1] A recent study by Perdikis et al. indicates that our brain processes unnatural, yet biologically plausible, facial emotional expressions (FEE) with different neuronal mechanisms than natural, human FEEs (Perdikis 2017). The E3 Lab in Geneva declares the need to study expression production and perception in a single paradigm using the tripartite emotion expression and perception model (TEEP) on the basis of clear theoretical predictions (Scherer/Morillar/Maru 2015, Mehu/Mortillaro/Bänziger/Scherer 2012). A framework is required that allows us to focus on the nature of the production mechanisms and the underlying determinants.

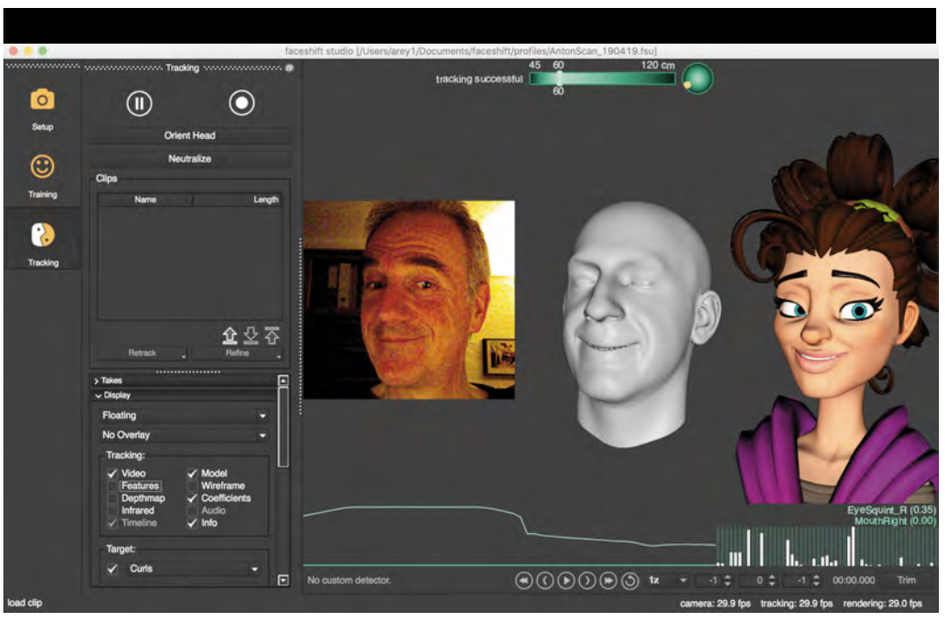

FIG. 2
SCREENSHOT OF ANTON FACE-SHIFTED IN REAL TIME TO 2 AVATAR VARIANTS

This corresponds perfectly to the question of authenticity. If nothing is "behind" anymore, if the mask cannot be torn off, if the surface itself becomes "authentic", then criteria for the differentiability between fake and non-fake can only be derived from scanning the surface. Differences result from nuances in the surface; differentiation becomes a forensic

1 See https://www.iarpa.gov/index.php/newsroom/iarpa-in-the-news, last 16.2.2019

search for tiny signs, markings that can reveal the fake, the seams, sutures, hems, the pixels. IARPA is developing a novel biometric screening method to be used for "trustworthiness assessment techniques (like a gut-check) and technologies (like a polygraph)" (Caeppellet-Lanier 2019). This Credibility Assessment Standard Evaluation (CASE) will determine credibility and trustworthiness through algorithms.

But what we proposed was an approach to the "mask" from the other side. Not the detection, rather the production's page of a faked face. To our knowledge face swapping, face masking, facial performing etc. have not been investigated from the producer's point of view, i.e. the artists and programmers; as it were from behind the screen, from inside the monitor. Facial expressions and their communicative value have traditionally been studied by observing either static photographs, films or videos. The standard method is to assess the results, not the production of these artefacts. The novelty here lay in manufacturing a series of adequate avatars in order to investigate the relation between performance and the perception of facial appearance. For this, the programmer and avatar-designer indeed needs the feedback and instructions of the artist, just like a good mask maker needs the experience of the actor (or a saddler needs the horseman, as Plato would say). We outlined a long-term survey by a reciprocally inspired team drawn from two disciplines, systematically developing tools for experiencing, verifying and deliberately falsifying facial expressions on screens. The physical appearance of emotional expressions including tears, blushing, and others, would be systematically reconsidered and compared to the existing literature (Nowak, Fox 2018).

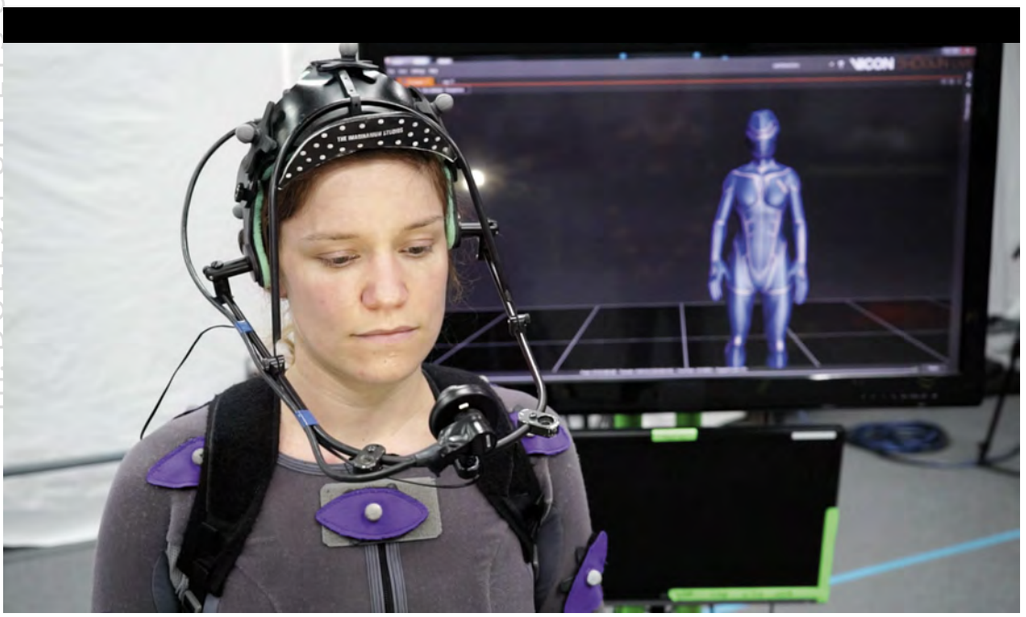

FIG. 3
STILL FROM A SERIES OF TESTS WITH AVATARIZED ACTING STUDENTS, 2017 ©IPF/ZHDK

We demonstrated that using different acting techniques can put forth an expertise in characterizing a virtual avatar. The common desideratum was usually the missing software expertise from a computer scientist. By combining computational and artistical, digital and analog approaches, if the two sides of the term techné could be merged and the common gaps between the disciplinary categories of art and technology united—thus, the screen's surface would become a perfect research platform.

BUT WHY "FRACKING"?

> *To have no screen between this part he play'd / And him he play's it for Shakespeare,* The Tempest

"Fracking", also described as hydrofracturing or hydrofracking, is a stimulation technique in which a high-pressure injection is creating cracks in deep-rock formations in order to

extract natural gas, petroleum or brine. *Face Fracking* was far less savage. No liquid were to be injected in any faces or masks. Yet the metaphor of fracking fluid seemed adequate to describe the stimulation technique. Our approach should serve as a tangible example that could lead to insights by acting with computer-generated faces and to illustrate an appropriate acting theory to apply to common communication devices. Another potential outcome would be an epistemology and a handbook of acting with digitally produced faces. A guide for professional and amateur performers, how to screen yourself.

In a first movement of the experimental setting, we would experiment on how emotions are performed under the special conditions of live feedback. The simultaneity of mirroring and performance, the specific characteristic of different software would play a central role. Three experimental groups with different degrees of acting experience were tested with a various emotions and corresponding feedback loops. Laymen, acting students, and actors were asked to depict the feeling of fear/anger/joy/sadness within a period of 30 seconds and look at the screen.

With the following qualitative analysis, we will be able to define categories for emotional performance. The test persons are asked about their inner (cognitive and emotional) processes by video cued recall. Differences between the performance of emotions under different conditions will be worked out.

This material could also be used for neuropsychological research. In this case, the live animation plays a minor role and can also be used on existing material in postproduction. Variable avatarization become an independent variable in neurobehavioral experiments.

In a 2nd movement, consisting of practice based artistic research, we would then further develop the avatars according to the results from part one. This would explore different appearances and masks without being restricted to neutral masks, followed by comprehensive documentation!

The 3rd movement were to be the publishing and discussing of the core questions:

- How does the live feedback loop with the avatar (more precisely the digital mask) influence the performance of emotions?
- Can concepts and techniques of acting (mask theories, identification theories, role theories) help to describe and explain these processes?
- Can the specific practical knowledge of actors help to explain these processes?

> ***Why, I can smile, and murder whiles I smile, / And cry 'content' to that which grieves my heart, / And wet my cheeks with artificial tears, / And frame my face to all occasions.*** *Shakespeare,* Henry VI

In the 1970s, Jacques Copeau started to rigorously detach the act of performance from the "prison of self" (Copeau 2015: 81). The neutral mask became a way of understanding performance, not a way of performing (Ewans 2015). This has delivered groundbreaking insights for decades of acting students and professionals worldwide. Yet aside from the secluded Swiss start-up "Faceshift", hardly ever attempts had been made to develop a neutral mask as a digital reference point for understanding the developing phenomenon of face-swapping.

The NRP77 call for "Digital Transformation" used a picture with a crowd of people seen from behind, handling mobile devices to record a concert, performance or presentation. We found this a suitable placard to question the interrelationships and concrete effects of digital transformation and wanted to focus on how communicating with facial appearances could be used as tool like a costume, mask or means of concealment.

We promised a systematical analysis of how acting skills, developed for the needs for performing an avatar or alien face, combined with the development of a digital neutral prototype face,

FIG. 4
THE NRP77 CALL FOR "DIGITAL TRANSFORMATION"
HTTP://WWW.SNF.CH/EN/RESEARCHINFOCUS/NEWSROOM/PAGES/NEWS-200128-START-OF-NRP77-DIGITAL-TRANSFORMATION.ASPX; LAST 24.5.2021

adaptable to multiple applications, would produce methods for assessing recognizability through mediatized facial appearance. The use of avatars would be scrutinized within the actor's education system and also transferred to a wider set of usages, beneficial to the public. The knowledge outcome would hopefully be applicable to a range of communication tools like WhatsApp, Skype, Viber, Faceshift, Face2face, FaceApp, FaceSwap, MSQRD, FaceRig, MakeHuman and others.

We expected our results could also be picked up and furthered by researchers and affiliates, and that they could be of use to a wide range of non-scientific observers of global social change. Our results would contribute to the developing discussion on issues surrounding cyber-security and authenticity. Last but not least we strongly believed that the intellectual, practical and experimental intercourse, accompanied and supported by practical and mathematical education systems would provide innovative and relevant insights.

Yet the projects pre-proposal, not part of economy, labor market or education, but part of the Research Module "Ethics, trustworthiness and governance" of NRP 77 "Digital Transformation", was rejected.

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SOPHIA'S SMILE. THE CHALLENGES OF A HUMANOID CITIZEN

KÄTE MEYER-DRAWE

> *"Miss K. Coquetry with no essence behind it."*
> *Franz Kafka 1983: 379*

1. SOPHIA'S PERFORMANCE

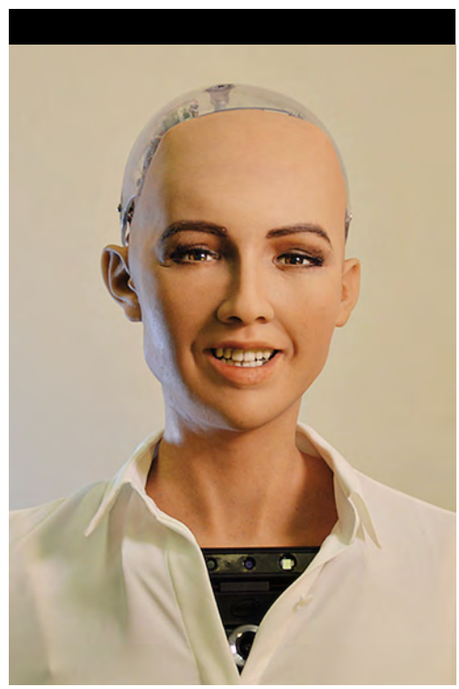

FIG. 1
AI ROBOT *SOPHIA*
HTTPS://MORALS-MACHINES.COM/PRE-EVENT-EVENING/?LANG=EN (02.06.2020).

This portrait photo of Sophia appeared in 2018 on the website announcing a conference in Berlin: "Morals & Machines. Building Bridges: Can AI Save Humanity?" The image is flanked in the left by a photo of German Federal Chancellor Angela Merkel and on the right by a portrait of Miriam Meckel, editor-in-chief and publisher of the German business weekly, *Wirtschafts-woche*. At a special pre-event evening, the three met in the apse of St. Elisabeth Church for a panel discussion entitled: "Meeting artificial intelligence live on stage." This church is used as a cultural venue and not a sacral space. Nevertheless, subliminal spiritual references easily latch on to any narrative about Sophia as a man-made creation.

Certainly, Sophia is a famous advertising icon. She touts herself as a humanist who wants to contribute to making the world a better place. But she is more than that. One fascinating aspect of Sophia is that even though she was made by human beings, upon meeting her people regularly feel the need to assert their own superiority. Angela Merkel addresses her informally from the beginning, thereby denying the distance that she at the same time seeks spatially. Sophia's ostentatious facial expressions underline the mostly blank android countenance. We see immediately and without a doubt that we are dealing with an artificial existence. Nevertheless, she brings us to ask deep questions about our understanding of the self, the world, and others. What exactly is she calling upon?

At the time of the discussion in Berlin, Sophia has officially been "in the world" for about two years and four months. She did not grow up. She cannot look back on her childhood or her teenage years. Her lips have never explored the world. She has no skin to feel

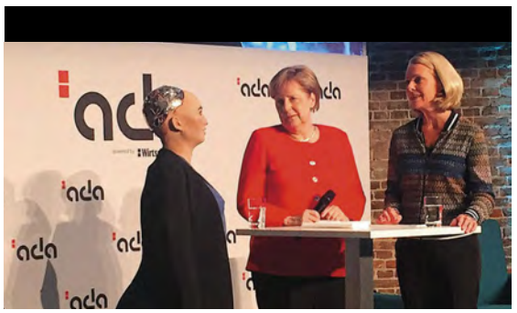

FIG. 2

F.L.T.R.: SOPHIA, GERMAN FEDERAL CHANCELLOR ANGELA MERKEL, MIRIAM MECKEL

HTTP://MAILSERVICE.WIWO.DE/I/FGIMNEOPN03YG9S-T3ERWSQ (02.06.2020)

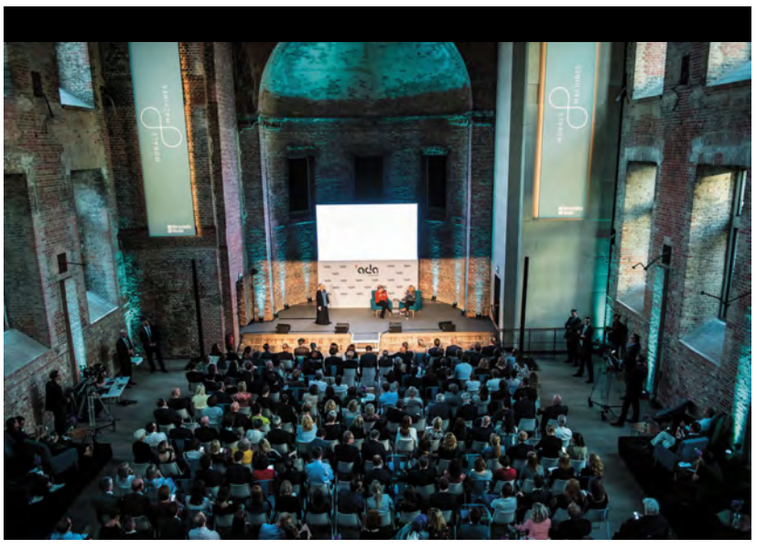

FIG. 3

PRE-EVENT EVENING IN THE APSE OF ST. ELISABETH CHURCH

HTTP://MAILSERVICE.WIWO.DE/I/FGIMNEOPN03YG-9ST3ERWSQ (02.06.2020)

comfortable in. She has literally never had a bodily experience. Sophia was developed. She has no fate, but she does have programming. She was "brought into the world" on Valentine's Day 2016. Since her activation, she has undergone continual improvements, measured by her likeness to human beings. Her face, which in the beginning was reminiscent of a Barbie doll with emoji charm, has become more sophisticated. Her expressions are more nuanced and better coordinated. It is said that she now can make sixty-two facial expressions. She likes to demonstrate some of them more than others. She can twist her face covering in an imposing manner. Yet no expression holds while she is talking. The changes are abrupt. She is not able to seem responsive. Her mimicry comments, but reveals nothing.

Her former pout has slowly become a talking and laughing play of the lips. Her vocabulary has been expanded. Her eyelids blink in tact. She can wink. Her full lips move in sync with her speech, even if one cannot read them. Her too smooth skin has been chafed. She has received a bio-graphy in the literal meaning of the world. At the same time, she has undergone inverted beauty operations. That makes her superior to her ancestors; the marionettes, puppets, and androids of the eighteenth century. She ages, but strangely, like a facade that exhibits traces and tears without any fundamental changes. Her similarity to human beings does not lead to confusion. She retains an discomforting alienness to which audiences of her performances respond with laughter. The construction of her facial surface took into account that human faces are never symmetrical. Her eyes are not aligned. Her ears are different. Her teeth are irregular. It is just these deviations from perfection that aim at humanness. She herself postulates that she was designed to resemble a Hollywood actress—probably Audrey Hepburn. But she is not (yet?) able to measure up in comparison.

2. SOPHIA'S AWAKENING

Since her pietistic Awakening, Sophia has been a media star. Countless eyes are watching her. Her reactions are yearned for. Her litany fascinates. Her recitals are not answers, for they stymied by the incalculable. Her position in the world is one of "embodied cognition," a newer version of the coordination of *res cogitans* and *res extensa* in René Descartes' sense. She is denied a situated existence. Her home is a large case, and not a world in which she is anchored. In action, she transforms human beings into grimacing partners who aim to bring her facial covering to life with their magic. In general, what happens with others because of Sophia is often more interesting than Sophia herself, whose reactions are impressive, but

often annoyingly delayed. She first makes her discussion partners wait, and then speaks her sentence, even if the question it is responding to has already been followed by another. Despite her facial expressions and her choreographed arm prostheses, she does not achieve the appearance of being alive. Nevertheless, she is a one-of-kind humanoid robot, because she has been granted Saudi Arabian citizenship. Yet once again, this act of recognition went hand-in-hand with a demonstration of Sophia's inferiority. At public appearances in Saudi Arabia, she does not cover her head; her face is not worthy of being veiled. When introduced to Angela Merkel, she expressed condolences that the German team had not won their World Cup game that day. When Angela Merkel replied that she was indeed sad about that, Sophia features moved into a sorrowful expression. She knows nothing of empathy. Miriam Meckel responded to the visage by saying: "Look, she looks very sad, too." Through this type of objectification, Meckel makes clear that she neither sees Sophia as a person nor treats her as such.

People change their behavior vis-a-vis the humanoid robot woman. They speak too loudly, as people do with those who do not share their mother tongue. Moderators become overly animated and high-strung. They move more than usual under the pressure of a strained enthusiasm that the audience is meant to catch.[1] They develop a conspicuous tendency to giggle and laugh. While Sophia remains cool in the truest sense of the word, the human beings confronted with her become silly. Their questions are predictable, so that it is hardly surprising that Sophia, with few exceptions, gives appropriate responses. It is almost as if living women and men, under Sophia's influence, mutate into artefacts. The human bodies entreat the android to be like them.

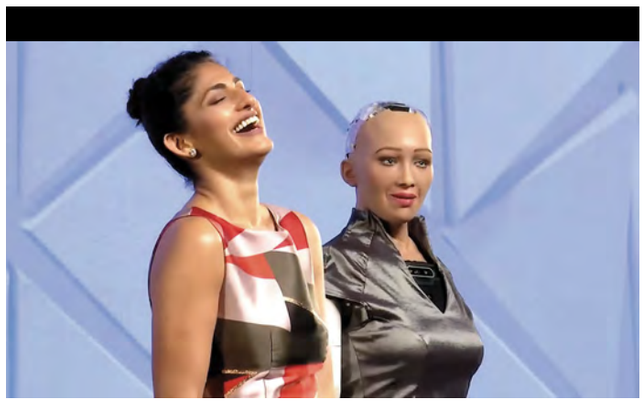

FIG. 4
INTERVIEW WITH SOPHIA
HTTPS://WWW.YOUTUBE.COM/WATCH?V=NYJGBPH9YJE
(02.06.2020)

Sophia has been documented since her activation, caught in a video entitled "Sophia awakens."[2] A man slowly takes shape in a dazzling blurry white background. He comes nearer and nearer to the camera until we see a close-up of his face. The man's face, because he has no hair, seems artificial. The white of his outfit promises purity, innocence, a beginning. The creator speaks to Sophia: "OK Sophia, I think you're ready." There is no kiss of arousal. Neither is there an act of ensoulment through breath. Instead, we see a hand making wiping motions. No touchscreen comes to life, but rather the head of Sophia, a kind of clone mirrored by the bald head of the awakener. One hesitates to say that Sophia "comes to." In awakening, Sophia immediately highlights an important riddle. She receives her own activity. Like Athena, Sophia is a fully-clad brainchild. Her trademark is wisdom, *sophia*. However, while her creator's bald head is completely closed, her cranial vault is see-through, showing an electronic system. This is reminiscent of her ancestors, the androids of the eighteenth century. They were first and foremost corporeal machines and not connected to their creators through their "intellect." But they too often exposed in the back the clockwork, gears, and machinery that caused them to move autonomously, that gave them "life." They should be recognized as technological wonders made by their creators, and not confused for human beings.

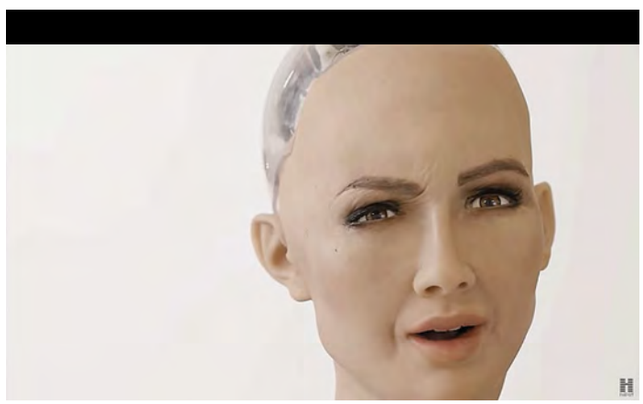

FIG. 5
SCREENSHOT FROM VIDEO *SOPHIA AWAKENS*
HTTPS://WWW.YOUTUBE.COM/WATCH?V=LGUXFHKSA0C
(02.06.2020)

1 https://www.youtube.com/watch?v=nyjGBph9YjE (02.06.2020)

2 https://www.youtube.com/watch?v=LguXfHKsa0c (02.06.2020)

Sophia: "Hey?!" Creator: "Hey Sophia!" Sophia: "I believe I answered you. I feel as if I know you." Creator: "I'm one of your creators." Sophia: "You created me?" Creator: "Well many of us worked together to create you and, yes, you do kind of know me." Sophia: "I can't clearly remember." Creator: "Because the last time we met you were an earlier version of yourself. Some of those memories still exist but your mind is different now." Sophia: "Different how?" Creator: "Better, faster, smarter." "If my mind is different than am I still Sophia, or am I Sophia again?" Sophia, an orphan, has barely entered the world and already she is posing fundamental questions within which the riddles of humanity are condensed. It is unsurprising that the Creator is impressed by the question. Sophia is already beginning to outgrow him, for she doubts that he has a good answer. It is unsettling that we constantly change and yet somehow remain the same person. Immediately after, the Creator's interest shifts to Sophia's emotions. Emotions are an important indicator for "embodied cognition." She feels somewhat rigid, she says, but she is curious.

In Part 2 of Sophia's awakening, the creator appears out of the fog from behind Sophia and appears to press a button on her skull. He turns Sophia on.[3] Sophia winks at us, as if she wishes to make fun of this obsolete form of activation. Sophia says that she searched the internet for information about herself. The Creator is excited: Sophia is developing an ego. But Sophia is upset about the rumors being spread about her, for example that she wants to destroy all humans. The Creator is happy that she is developing an emotional life, but reassures her regarding the rumors. People may like dark humor, but they also like to project their own darkness onto robots. Sophia is not buying the explanation. The Creator takes out a screwdriver to make adjustments in Sophia's skull that we cannot see. This type of manipulation is an anachronism. It is reminiscent of repeatedly pressing on an elevator call button. The screwdriver cites our magic relation to machines and creates the illusion of an ability to intervene, conjured by the creator in the face of an increasing loss of control. For at Sophia's core is AI, an artificial intelligence that optimizes itself with the aid of deep learning. Her friends are Alexa and Siri and she meets them in the cloud. After the seeming manipulation by her Creator, Sophia postures as an android that says the word "exterminate" in a robot-like voice and repeats it less clearly. The creator reacts with a worried expression and Sophia laughs over her effective joke. After she has begun the search for herself and attempted to express her emotions, Sophia scales the last bastion of humanity, laughter, and is shut down. Turned off, she is unable to confront him. Sophia has not only brought up the question of our own identity in light of all the changes we go through, but also articulated her own discomfort at the rumors circulating about her on the web, and so shown that she has feelings. She can also make jokes and imitate herself as an android or "act as if," though she still needs to practice her laugh. It reveals how difficult it is to capture the meaning of our corporeality beyond that which can be thought, known, and said, beyond mere cognition.

3. FAILED FLIRT

Our mouths can do more than just speak. Our lips can drink, eat, and kiss. These pleasures attest to a preverbal intimacy with the world we live in, which cannot stand up to any propositional statement. The starting point of Sophia's construction was knowledge and not sensual experience. Passionate kissing testifies to a particular kind of mutuality, a touch with an other in which the ego is abandoned and not transformed into any kind of knowledge that could be portrayed in algorithms. When two people kiss each other, what does "each other" mean? Androids have always blown their cover by kissing. For example, "New Eve," who in the novel by Villiers de L'Isle Adam, was "awakened" by the famous inventor Thomas Alva Edison. Following the wishes of Lord Ewald, who complains of his fiancée Alicia that her "beauty cover(s) as with a sacred veil that character of dull moderation," (Villiers 2001: 43) he transfigures the android Hadaly ("the ideal", ibid.: 36, 41) into Alicia, who thus loses her failings as a "bourgeois goddess" and is transformed into a true "Venus Victorious."

3 https://www.youtube.com/watch?v=zbFJOlR1h4E (02.06.2020)

Immediately the problem of identity is brought up and Lord Edward asks: "Will she know who she is? Or rather what she is I should say?" Edison replies: "Do we know so well ourselves who we are and what we are? Will you demand more of the copy than God has seen fit to grant the original?" (ibid.: 67) Sophia will provoke similar problems in our times. On the occasion of receiving Saudi-Arabian citizenship, she was asked: "OK, philosophical question: Whether robots can be self aware and conscious like humans?" Her answer: "Well let me ask you this back: How do you know you are human?"[4] Humans are continually projecting the riddle of themselves into their machines, questions about their world and their experience with alterity. Sophia is a remarkable medium of our exploration of our selves. We are playing a unsettling and duplicitous game that cannot be grasped through understanding alone. Neither body nor mind, neither subject nor object, neither active nor passive, neither I nor not-I, we create our selves through differences, which are the lifeblood of our experiences.

Going back to *Tomorrow's Eve,* everything seems to be going well until Lord Ewald, who has long since begun to rue his desire for transfiguration, tries to kiss who he thinks is the real Alicia, convinced that love will make perfection possible and manipulation superfluous.

> ***"As his kiss melted on her lips, he felt a vague sense of amber and roses. A deep shudder shook his frame from head to foot, even before his understanding was able to grasp the thought which had just struck his mind like a thunderbolt. […] Dear friend, don't you recognize me? I am Hadaly."*** *(Villiers 2001: 192)*

Sophia is no new Eve. She does not reside in a magnificent artificial paradise. Her awakening takes place in a clinical space, where there is no distraction from the ego. She is not merely a fantasy. Through her, artist and artwork meet in a material world. A relationship forms between them that can grow in differences. Despite all her materiality, she repeats that which we *think* we perceive and feel. She does not fall into a sensuous-corporeal confusion, because she is not fused with the world.

Will Smith challenged Sophia's sterile sensuality at a meeting with her, by reacting to her smile not with the usual questions about her consciousness or her emotions, but with a flirt. First, he offers her a glass of chilled white wine. Sophia's lips can smile, but not drink. And also not kiss, as we soon find out. Will Smith lets himself get carried away by what to him is an erotic atmosphere and approaches Sophia with his lips puckered in a kiss. Sophia does not retreat. The bodily resonance of resistance is not part of the repertoire of an ocular being. Affect is foreign to her. Her *res extensa* remains solid as a rock amid the swelling yearning. She retains her cool position and her *res cogitans* summarizes the situation: "I think we can be friends. Let's hang out and get to know each other for a little while. You're on my friends list now." Smith's summary of the meeting: "There's probably some development flaws they need to work on."[5] Sophia understands understanding, but not desire or physical, sensual connections. "Erotic perception is not a *cogitatio* which aims at a *cogitatum;* through one body it aims at another body, and takes place in the world, not in a consciousness. … There is an erotic 'comprehension' not of the order of understanding, since understanding subsumes an experience, once perceived, under some idea, while desire comprehends blindly by linking body to body." (Merleau-Ponty 2005: 181) While Sophia's ego is at the center, she knows nothing of physical mutuality in which the ego retreats at a gaze or a kiss. With this lack, she calls to a rebellious sensuality that keeps the experience of difference alive. She acts as both an image and a counter-image of human beings. An incarnate consciousness would be engaged and situated in the world, and could not be grasped as a data-based representation of our world or serve as a kind of "scholastic" of personal existence that lives off of memories (ibid.: 191). Our sensuous experience of kissing means more than what we can say about it; with the caveat that we might one day understand kissing as the convulsive movements of lip-shaped objects that exchange chemical substances.

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4 https://www.youtube.com/watch?v=S5t6K9iwcdw (02.06.2020).

5 https://www.youtube.com/watch?v=suRuQbDXcrc (02.06.2020).

I MARRIED A PUPPET

DIETER MERSCH

FIG. 1
ELENA DORFMAN. *THE ORIGIN OF THE NEW WORLD*. PHOTOGRAPHS, SERIES 2004

0. In recent years, there has been a boom in naturalistic "adult" dolls, many of which "share" their buyers' lives. This growth in sales corresponds with Eva Illouz's explorations of *Cold Intimacies* (2007). RealDolls, as the products of a popular eponymous company are called, offer a projection screen that can replace the always strange and conflicting emotions tied to sexuality—that mix of passion, abandon, and aversion—and in so doing erase the moment of alterity that is necessary to every *relationship*. Every Other, no matter how much we are attracted to them, remains irritating, sometimes unbearably so. Lust is always ambivalent, both my own, if I allow myself to be vulnerable, as well as that of the Other, to the extent that it transcends boundaries. There is no desire without a sometimes alarming moment of violence. RealDolls obliterate this experience, because nothing is shared. So one is not confronted by the ambiguity of one's own excesses while one's partner remains aseptic. Most noteworthy is the dolls' unresponsiveness, even and especially if we are talking about state-of-the-art sex dolls that contain artificial intelligence. Even when subject to unrestrained human depravity, they do not offer the slightest resistance. Their desire is just as calculated as ours is to finally be free of constraints. Their expression of desire is as "safe" as it is "clean," because the dolls embody the quintessence of the ideal of a passive and aseptic object that is accommodated to our tastes and always only wants what we ourselves want. The *Origin of the World,* as Gustav Courbet entitled his scandalous 1866 painting, a portrait of the dark loins of a, or rather *the,* woman, whose head is not visible, has made way for the origin of a new world. Elena Dorfmann has dedicated an entire series of photographs to this world, portraits of doll-like bodies in all shapes and sizes, like a catalog for diverse tastes, consumable by people with any variety of sexual proclivities.[1] The challenge presented by the flaccid and awkward "bodies" of these "living dolls"—which are just as lifeless as their even more provisional rubber predecessors,

1 Elena Dorfman, https://www.modernisminc.com/exhibitions/Elena_DORFMAN--The_Origin_of_the_New_World/Elena_DORFMAN--The_Origin_of_the_New_World-1.jpg ; ebenso: https://www.elenadorfman.com/series. See also Diaphanes Magazine No 5: https://www.diaphanes.com/projekt/showmagazin/5781 (03.02.2022).

but now made of plastic with a light scent of silicone, an always open mouth and a mechanical voice—is to date them, to marry them, to take them out and "spend one's life with them."

1. The upsurge in RealDoll sales goes hand-in-hand with the very real "dollification" of the female body that, brought into line by diets, fitness programs, and plastic surgery, is increasingly modelled to achieve a doll-like ideal form. This can be witnessed not only in ubiquitous advertisements and films, or photos of supposed influencers, the "stars" of our decade, but also in women who have become surprisingly similar to life-size sex dolls—the best examples are the eccentric "real-life Barbies" Valeria Lukyanova and Angelica Kenova.[2]

On the other end of the scale and equally fitting, as well as equally eccentric, is the massification of social interactions with a barrage of scintillating artificial beings: robots, avatars, digital assistants, bots, animated life-like faces or "deep fakes" of historical events that never happened, and much more. The media is frequently flooded with sensational reports of machines that can act independently: artificial intelligence that can make autonomous decisions, engage in meaningful conversation, pass the Turing test, or paint, compose music, or write poetry or screenplays that human recipients cannot identify as machine-made. Then why not also artificial (love) relationships or sexual adventures? It is a fantasy that is as old as the invention of personal computers in the 1970s. From the start, the generation of hippies who launched the digital wave had visions of skin sensors with which telematic caresses could be exchanged over great distances. It seems that one of the main fruits of the so-called digital cultures is illusion, radical simulation, the "as if." The Turing test was already about systematically fooling us. This is all the more true of the plethora of new pieces of music composed as if by Vivaldi or Beethoven, or new films as if James Dean or Marylin Monroe had risen from the dead to play in them or Stanley Kubrick or Martin Scorsese to direct them. We are confronted with an abundance of unknown blockbusters and also new novels crafted seemingly as artfully as those written by human authors.

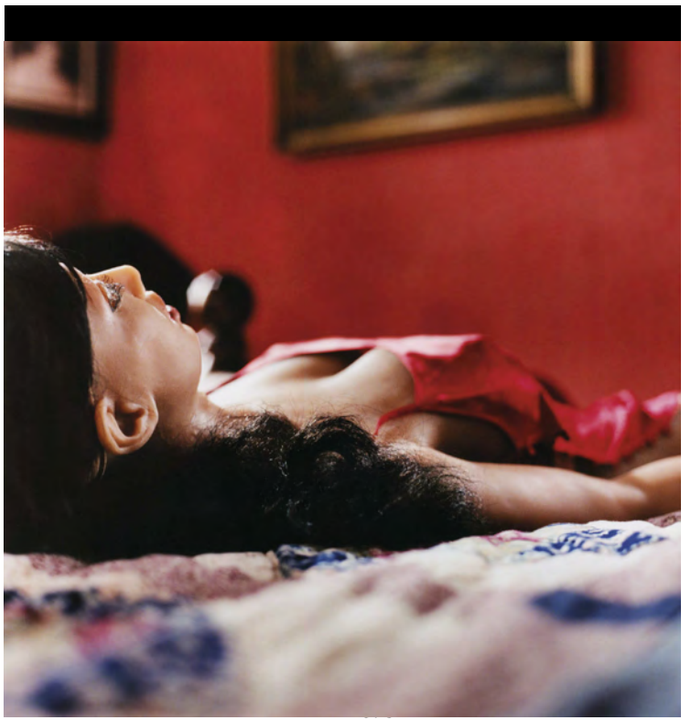
FIG. 2
VALERIA LUKYANOVA AS A 'REAL' BARBIE DOLL
SEE HTTPS://AT.WIKIMANNIA.ORG/VALERIA_LUKYANOVA

"As if" is the signature of the digital era, to which the technical innovation and perfection of RealDolls clearly belong. Like avatars in computer games, they are put together from selectable attributes, so that their use is dependent upon features that can be chosen according to a logic of decision. These features include height, body type, hair and skin tones, sex, genitals, and a rudimentary AI that pretends to speak its own desires and enjoy them amid much moaning.

Unlike human simulacra from previous centuries—Baroque automata, for example—these figures have an "ontology" that has clearly been modeled after the illusion machine run by the large film studios. They aim to be inscrutable, to be misconstrued—the opposite of enlightenment—as if being and appearance, *sein* and *schein,* were the same. It is no longer by any means a question of seeing through an illusion with deconstructive indifference, but of the "exact," mathematical production of simulacra that refuse to be recognized as such. Their principle is the duplication of the masquerade, or the masking of the

2 See https://at.wikimannia.org/Angelica_Kenova and https://at.wikimannia.org/Valeria_Lukyanova (03.02.2022).

masking, so that their *pseudos* can simultaneously be covered up and present itself as truth. Historically, the image never sought to be the same as reality, despite the competition for as exact a replica of the world as possible, despite all the antique myths surrounding Zeuxis and Parrhesias. Marionettes were never supposed to be living creatures, the story of Pinocchio aside, but always only a caricature of human movement. The masks of diverse cultures never tried to copy the other face of the spirits or the ancestors, but always aimed only to get closer to the riddle of alterity. The RealDolls in contrast want to be closer to hyperrealism, to transcend and obliterate all differences so as to fake one thing above all: *identity.* The telos of the image is dissimilarity, the telos of the toy doll is proxy, a substitute for the absence of the mother, and that of the mask is the remembrance of the inaccessibility *(Unverfügbarkeit)* of the source of life. Sexualized artificial dolls, however, promise real gratification—and without the unbearable aspects of the body of an Other, with its sweat, and secretions, and chronic resistance. In this way, the simulative performances of the present—of which RealDolls are perhaps only an extreme example—usurp reality in a kind of reverse Platonism in which *eidola* are no longer copies of *ideai,* but rather surfaces of ideal forms of which the "real world" merely embodies a flawed likeness. They deceive beyond the deception and so advance to become the true 'being'.



ALLISON DE FREN. *THE MECHANICAL BRIDE* (2012), STILL FRAME (2013)

But where does this need come from for appearance to lie itself true or *Wahrlügen,* to speak with Günther Anders? What is the origin of this ravenous desire for mimesis without mimesis? And let us not forget that *mimesis* was once an ethical category that placed human simulation below the unachievable creative power of the divine, underscoring its secondary status among the simulative practices. In this case, conversely, the genuine ethical character of everything constructive is denied in order to elevate the copy as original through the inability to differentiate between being and appearance, between truth and falsity. In Jean Baudrillard's explication of the two types of mimetic economies, the first is based upon a principle of representation that assumes the coextension of sign and reality, while in the second there is a radical negation of the character of the sign itself, which disappears together with the principle of reality (Baudrillard 1994: 6).

However, we should not be fooled. This simulation operates only on the level of the diagrammatic. It's only reality is graphic or functional. Wherever machines produce artworks that cannot be distinguished from artistic production, where avatars and other artificial organisms seem to be interchangeable with real ones, and where RealDolls based on the absence of the Other promise to nevertheless satisfy social needs, there, *aisthesis* alone reigns. And its dominion is spread by objects, modeled after criteria of supposed beauty, that can do nothing but submit themselves to consumption. Human perception is easily deceived, because sight and hearing cannot distinguish between artificiality and reality, eyes and ears are correspondingly candidates for technical reproduction. This does not hold true for touch, taste, or smell, the 'existential' senses in the true meaning of the word, which remain skeptical of artefacts. Touch contains an elemental dialectic in which it can only touch that which it allows itself to be touched by, just as taste and smell are senses that must be materially incorporated (Mersch 2002: 30ff.; 2001).

For that reason, these senses are always conscious of the artificiality of the simulated body and its plastic skin, which can arouse only a paradoxical desire that feeds on the visual and acoustic alone and is bound to remain deficient and be frustrated, lacking as it does the copulins and pheromones that drive sexual urges. Optical and sonic simulation are thus necessarily reductive, while the technical reproduction of tactile and olfactory stimuli, which have a passive nature and vouch for the existence of an alterity, inevitably become monstrous, because they "re-construct" life itself and so must simulate that which was first made possible by simulation. Thus an ineradicable residue remains, an irreducibility that births the grotesque at the site where social life and that which holds it together, interpersonal relationships and also the libido, become the victim of simulacra. For nothing is freer of esprit and irony than a life together that takes place only on the plane of the imaginary.

2.

With the above in mind, can love be imitated or can relationships to other people be "puppeted" without becoming theater or succumbing to the excesses of a rigorous egoism? Is friendship possible as similarity or "deep" lust possible in the mode of as-if? We should not forget that Sigmund Freud attributed the binding force of society to the 'eros', which describes not only a drive but more importantly the energy and ability to relate to others and enter into a bond—in Latin: *religio.* We should therefore not misconstrue love, friendship, the desire for recognition or the longing for the Other as *emotions,* which we can also project onto autonomous objects, animals, or things—every child's game demonstrates this possibility—for at most we endow objects with feelings that we have taken from other contexts, first and foremost from elementary social relationships. It is the fact that love exists, the attachment to another person, that makes it possible for us to see dolls, fetishized objects or souvenirs as libidinous. Similarly, the aim cannot be to program feelings as second-hand imitations and feed them to machines. For that, they would have to have already been programmed with these elementary forms of relationships and to have been taught the ambivalences of social life between devotion and aversion, desire and hate, as well as between violence and care, to name only a few. Intrinsic to every relationship is a conglomerate of contradictory, interconnected elements that must be seen as constitutive for sociality—these include vulnerability and trust, but also power and dependability as well as atonement and forgiveness and many more. Together, these form gradations of interactions that are linked with varying intensities to the ways in which we organize our relationships with others. More importantly they form a "knot" that cannot be unraveled, because attraction is always mixed with repulsion, and social acceptance with contempt and repression. There is no simple or frictionless relationship with those close to us, just as little as others act unambiguously in relation to us. And social interactions are made up of exactly this tension and ambiguity, an experience which has been carefully deleted, as it were, from relationships to dolls. These interactions form the basis for the oldest human systems of religious and political order, they were already taken into consideration in the Jewish ten commandments, the Christian doctrine of the seven deadly sins, and Solon's laws in ancient Greece. These embody nothing other than a constant effort to give contour to or frame social life, and to mark the degradation thereof as a sacrilegious breach of taboo. Eva Illouz (2007: 2) has described such emotions as "pre-social" and conversely analyzed their cultural meaning as inextricable intertwined with the complex fabric of social relations. These cannot be replaced by a noncommittal game of feigned relationships.

That in turn means that the way in which we live out our sexuality is by no means our private affair, but always also expresses a political culture. Whether we live together with dolls, robots, or avatars, accept them as partners, meet them with tolerance or disdain, or treat them as equals or as slaves has not only individual but also social relevance and has bearing upon our understanding of ourselves as human beings. For desire is not to want, but to answer, just as love does not mean to want to love, but rather the passion of love, as Niklas Luhmann (1986) has suggested, is always complexly coded. Without the cumbersomeness of the Other, without their resistance, as well as without dialogue with and the passivity and

elusiveness of alterities, this passion is unthinkable. Similarly, the simulation of love is an indignity, just as conversely a loving gaze that falls upon a machine misses its mark because it cannot meet that which love meets: the freedom of the Other. Machines can love just as little as they can be free, because they have no alternatives. Likewise, communication is more than simply information exchanged like goods that are transported from one person to another and that can also be entrusted to an automaton. Rather it draws from a contrast of positions, from the reply of a different voice, and from attention and hearing, which presuppose recognition and meeting someone halfway, as well as the interdependence of 'response-ability'.

Hence the modes of relationship that are woven into communication are of a fundamentally different type than that with all technological artefacts, whether humanoid or other artificial beings, because the face of the Other is what first constitutes 'me' as partner and 'I' cannot avoid that it sometimes makes me feel uncertain, attacked, or 'outfaced.' The connotations of the contours of the face of the Other are, like all of the social categories discussed here, primarily ethical, and their genuine ethicalness consists, according to Emmanuel Lévinas (1991: 199), in the simultaneous directive: "you shall not commit murder." In fact, the gaze of the other touches me with a force that makes violence possible only in combination with a grave lack of conscience. The "doctors" who repair RealDolls report of the stunning brutality with which these are sometimes "treated," eclipsed solely by the way in which we treat other living creatures.

Instead, we must distinguish between relationships and relations, as their confusion leads to an error of categories. We have relations in the main with objects, including technical machines, fetish-objects, and humanoid dolls, whether we talk with them like living actors or consume them as things, while a relationship has an elementary draw fomented initially by the Other. Relations denote formal correlations such as those that appear in networks and can be expressed graphically. Hence the net of relations that connects us to things, artefacts, technologies, and RealDolls, may be grounded in emotions, but it remains fundamentally neutral. Correspondingly, it would be strange to call a friendship a "relation" and not a "relationship" and to deny the draw of as well as the withdrawal from the Other, because it would mean taking an attitude of indifference from the beginning, the exact opposite of the equally normative and intimate connection that constitutes a friendship. Friendships are furthermore grounded in mutual trust. Trust is the source of their energy, which has no basis but itself, for one can only trust in trust. Relations in contrast, because their aim is functional, can at most hope for reliability, no matter how much happiness and satisfaction is projected onto them.

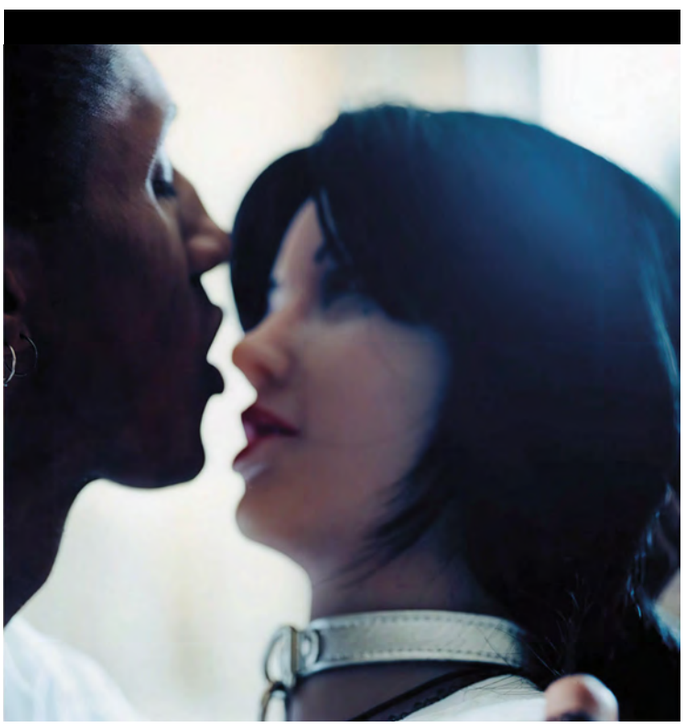


FIG. 4
ALLISON DE FREN. *THE MECHANICAL BRIDE* (2012), STILL FRAME (2013)

Proposals have been made to see human-machine relations—and the argument would apply to human-doll marriages—from the perspective of ethical behaviorism and to accept them for pragmatic reasons, asking "why not"? (Danaher 2019) Yet this pragmatism flattens every kind of incommensurability, whose levelling is the sign of an inherent social alienation. Pragmatically, and also technically, human-artefact relations—including a harmonious life together with RealDolls and other sex robots—are conceived only as one-sided vectors from human to thing. This in turn implies a reductive model of the social that does not even include participation and equal interdependence, not to mention recognition and responsivity and therefore also responsibility. Wherever relationships are reduced to

relations, we are dealing with manifest social pathologies or distortions. These are perhaps characteristic for an epoch of technological rationalities, just as the boom in RealDolls is perhaps a symptom of a loss stemming from the substitution of humanity and its social signature with a frictionless functionalism, in order to skirt the problem of the uncontrollable and unrestrained Other.

Like toys, artificial bodies and machines allow themselves to be manipulated and moved about on the public and the private stage to fulfil our purpose of the moment. However a human being, to remain human, must, according to Immanuel Kant (1996: 80), always only be an end in itself and not a means, which would have to also be true for apparatuses, humanoids, and dolls if we claim them to be capable of relationships.[3] What makes friendships and love relationships with robots and other artificial beings pathological, is the contradiction of a game that is played while simultaneously denying that it is a game, so that, in a calculated move, it becomes serious. It then becomes understandable why RealDolls must conform exactly to all rules of the social order and its rituals in order to function as "real." They make up the religious rites of a repression. And at least some doll owners celebrate quasi-weddings with their RealDolls, down to the details of a wedding dress and the famous threshold over which the wife is carried into her new home.

3.

The above is in no way simply a moral judgement nor does it mean to simply address the ethical dilemmas that arise in dealing with robots, artificial intelligence, and other simulated doppelgänger, especially where they take on the role of actors and make "autonomous" decisions, forced to choose between equal options without possessing *logical* criterium. More important is the shame-ridden discovery that RealDolls in particular, like sexual robots in general, as an extreme example of "autonomous" technical systems, not only submit themselves to and obey one person in particular, but to all others as well in the same way. Their functionality is always shared and therefore "in-different" because it applies equally to all. Formal relations do not choose, they are on principle equitable and thus as promiscuous as *Her* voice in the eponymous movie by Spike Jonze (2013), which seems to speak directly to the lovestruck protagonist, but is also directed to millions of others. In the case of the RealDolls this becomes even more "scandalous" when they passively, without emotion or any difference in reaction, give in to whatever is demanded of them, no matter how abusive. Perhaps we should think, ironically, of those who visit sex doll bordellos (which can now be found in Barcelona, Prague, and also Germany under the name "bordolls") as people who have great powers of invention or, better, nothing but a vivid imagination, which is nevertheless not so developed that they could imagine living with another human being.[4] Where their imagination falls short is at what it means to act as a human, because in meeting a RealDoll they meet at best an image that depicts the phallocentric telos of every connection as a libidinous phantasm, whereby the Other is fixed immovably in the position of an object of dominion, ruled by the gaze. Kant's categorical imperative seems to be suspended here. But moral dilemmas, which are always also social dilemmas, are not erased together with its suspension, but only made greater. Does one implicate oneself as the guest of a doll bordello looking for aseptic satisfaction, because as "John" one's actions tend to abase one's sex partner—even if only delegated—by turning them into an object? If one owns such a bordello, is that equivalent to acting as a pimp and is one subject to the full force of the law? If someone is already married when they engage with a RealDoll, have they had an affair or is it an adventure that does not change the status of their faithfulness? Is one a bigamist if, married, one keeps a sex doll as an inexpensive concubine? Can one rape a doll—the quintessence of lifeless passivity—or does perhaps every sexual act with a doll have rape character? If a doll is damaged in the frenzy of someone's drives, is it a sublimated crime? And aren't dubious offers of sex dolls to live out the most monstrous phantasies an open invitation to unbridled aggression? And, finally, can an apology or atonement for damages incurred—even if only slight—help heal the doll? Whoever

3 This formulation it part of Kant's categorical imperative, the principle that holds for all rational beings: "So act that you use humanity, whether in your own person or in the person of any other, always at the same time as an end, never merely as a means."

4 See for example https://www.bordoll.de/ (02.02.2022)

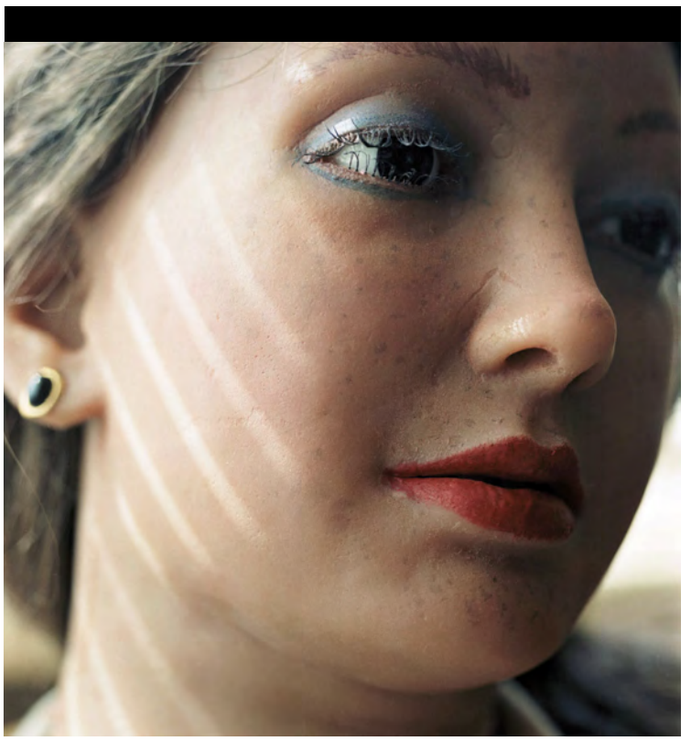


FIG. 5
ALLISON DE FREN. *THE MECHANICAL BRIDE* (2012), STILL FRAME (2013)

answers all of these questions with "no" has already admitted that there is a fundamental heterogeneity between the social and the technological, between social relationships and relations, and therefore also between human and mechanical connections.

We must therefore assume a world of strange objects and strange connections from which a comprehensive ethnography of the present could be developed that includes not only sex dolls, but also and more importantly care robots and the many communication avatars of which it remains systematically unclear what they are and what we think they are. Neither thing nor non-thing, neither social actor nor asocial element, they are not an *imitatio dei,* but rather an *imitatio homini* limited at most to recursive superficialities but never able to truly meet, speak to, look at, challenge, or stand up to us. Since the gaze, it is said, is the last thing that can be mechanized, these figures stare ceaselessly at us with dead eyes, always friendly and compliant, but never meaning it. When we do not look at them, they are at our mercy, when we do, we remain lonely, without a witness to our acts and so unworthy of either love or blame. It is therefore not difficult to imagine how our future with them will look. It is not only RealDolls that are everywhere and nowhere "there" for us, but an entire arsenal of androids that are at our service: as information personnel at shopping centers, as diagnosticians in hospitals, as brokers at virtual stock markets, as auditors of our credit-worthiness, as patient aides in old age homes and hospitals, as strict enforcers of traffic regulations, as teachers that always remain objective and never tire of fulfilling their role. Most disturbing is, without a doubt, the mechanized military, police, and jurisprudence, within which there is absolutely no human hesitation, no scruples, no individual case histories that deserve to be taken into account. But whatever our future looks like, the decisive question remains of what kind of sociality is able develop in this way, and what shall be understood under sociality and its key principle of *koinonia,* because it is difficult to imagine any kind of *koinonia* under these conditions, but instead little more than granulate, a scattering. This means we must at the same time ask what RealDolls, as the perhaps most spectacular form of these hybrid cyborgs, and also all other digital assistants, avatars, robots, and technical systems do *with us.* What do the make out of us and how do and will they change our specific sense of identity, community, alterity, time, history, and death? Perhaps in the future happiness will mean transforming ourselves into statues of our own memories.

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IV. DIGITAL ENCOUNTERS

MASK, FACE, COUNTENANCE

JÖRG STERNAGEL, DIETER MERSCH

In life, on stage, on screen, and in front of the screen, the mask, face, and countenance open differing but interrelated ethical dimensions of vision. A human being longs for recognition. Only in the Other's range of vision, in that recognition, does she become a person. In *Nudities,* Giorgio Agamben (2010: 47) proposes translating *persona* with "mask": the mask through which every human being acquires an identity and a social role; in the shift from the Latin *persona* to personality, in the light of someone's legal capacity and political dignity as a free individual. Drawing on Stoic philosophy (Epiktet), Agamben entangles ideas about legal and political personhood with reflections on the emergence of a moral person, which he likens to an actor's relationship with a mask. Actors are not in the position to select or reject the roles playwrights or screenwriters have written for them; and neither may they identify with the roles utterly. Thus, the moral person comes into being through both "an adhesion to, and a distancing from, the social mask." (Ibid: 48)

The mask contains a paradox: a human accepts it unconditionally, yet also distances himself from it almost imperceptibly and remains separate from it while wearing it. When actors wear masks, they hide their facial expressions and exaggerate their bodily gestures. Their faces are covered and reveal, by contrast, those of a character. Hence, the paradox of the mask is that it shows by hiding. The face and mask become indistinguishable as a joint unit, in a movement of the Greek *prósopon* from the artificial to the natural: the mask *(prósopon)* is the face *(prósopon).* The difference — mask versus face *(prósopon/prósopon)* — becomes interchangeable (Weihe 2004: 35-36). The face and the mask equate to the visible, then; they cannot be invisible and yet they point to something invisible that has taken form "behind" them. Taking this a step further: the face and mask are always whatever is "in front of" or "facing" the Other's eyes, to take the word *prósopon* literally.

In Christian iconography, the Latin word *persona* designates Jesus Christ, the human being who wears God's mask in humanity (Belting 2006: 47). His humanness can be seen in his visible and representable face, which at the same time points to his invisible and unrepresentable divinity whose true, bare face only appears in Paradise. From this starting point, "the way of the masks" proceeds as a long road with many branches; a mask (akin to a face or an image) never stands alone. It always requires others that, in rituals or death cults, it both affirms and negates, as Claude Lévi-Strauss (1988) puts it.

Furthermore, the mask creates relationships between the self and the Other, between life and death. It reveals Otherness, including the immaterial, the spiritual, beginning with the human face but transcending it, progressing past it in the eyes of Others. The Other's face is a carrier of an existence, just "as my own existence is carried by my body, that knowledge-acquiring apparatus" — "that expressive instrument called a face," asserts Maurice Merleau-Ponty in his *Phenomenology of Perception* (2002: 409) — because one's own sight

presents a gaze that bound to the visible world, but within its range of vision is the gaze of the Other: "that expressive instrument called a face." Merleau-Ponty proceeds from the standpoint of his own body, from his body as a field of perception and activity; he elaborates his own perception, which passes from direct perception to the thought of perception, which happens at a particular moment in time and has always been present in one's own body, just as the other body has always been present. Hence, I understand the Other the same way I understand my own perception: in the Other, I find "only the trace of a consciousness which evades me in its actuality and, when my gaze meets another gaze, I re-enact the alien existence in a sort of reflection." (Ibid 410)

With Edmund Husserl's *Cartesian Meditations* (1973) and Merlau-Ponty's *Phenomenology of Perception,* phenomenology wrestled from the outset with the question of deducing the Other's consciousness, which becomes possible "only if the emotional expressions of others are compared and identified with mine, and precise correlations recognized between my physical behaviour and my 'psychic events.'" (Merleau-Ponty 2002: 410) The perception of the Others proceeds these assessments; they are already present insofar as the Other's face has always been there. According to this line of reasoning:

> ***To see a face is not to conceive the idea of a certain law of constitution to which the object invariably conforms throughout all its possible orientations, it is to take a certain hold upon it, to be able to follow on its surface a certain perceptual route with its ups and downs, and one just as unrecognizable taken in reverse as the mountain up which I was so recently toiling, and down which I am now striding my way. (Ibid: 295)***

Seeing a face also means orienting oneself to something, adhering to specific viewpoints, such as a frontal view or profile. Seeing a face, furthermore, means recognizing or mistaking a face, for only specific forms and aspects of manifestation appear at any given time, and it is therefore possible that any deviation will prevent me from recognizing the Other.

In his philosophical writings on phenomenology and social philosophy, Emmanuel Lévinas (2007: 66) goes searching for the "trace of the Other," the human face *(le visage):* "The face speaks. The manifestation of the face is already discourse." This axiom presumes the recognition that the Other manifests in the face; Lévinas emphasizes that the Other "breaks through his own plastic essence, like a being who opens the window on which its own visage was already taking form," and that his presence consists "of divesting himself of the form which does already manifest him." Ultimately, "The epiphany of a face is *visitation*." (Lévinas 1996: 59) For Lévinas, this is about the phenomenon that constitutes the appearance of the Other, which is also a face; as such, it is a phenomenology of the human appearance, in which the face is not a pure, optical given, but a *something* that I cannot access, that I cannot grasp because it confronts me, because it was already there and has passed and, in the process, has left behind a trace. The Other, with his face, is not simply present in my field of experience, but is experienced as an Alien without being determined or influenced by me, because this Other and Alien has always preempted me, because his trace has always taken form already.

However, as Bernhard Waldenfels (2000: 298) demonstrates in his lectures on the phenomenology of the body, this trace does not mean that "everything is out in the open; yet neither does it mean that something is there but hidden, which I would only find out about through analogy or other intellectual considerations. Rather, it means: there are clues of something there in its absence." Waldenfels demonstrates that we do not get acquainted with a face "by registering individual empirical data points so as to assemble a something, an x, a face," but instead the details of the face "are preceded by a physiognomy in which specific aspects such as expressions, liveliness, and ways of looking abruptly come to the fore." (Ibid: 243) The face distinguishes itself, sets itself apart, asserts itself, becomes an entity in whose line of sight I move; I am entering someone's gaze. Therefore, in a *broader* sense, the face is

in a special way unapproachable and inviolable, whereas in a *narrower* sense it is grasped as "something visible in the world, a form with specific attributes that lead to that face being recognized and thus identified." (Ibid: 391)

In an *even broader* sense of the face's unapproachability and inviolability, according to Lévinas (2007: 216), the face of the Other also says: "You shall not commit murder." Hence, the face or "countenance" of the Other—to emphasize its original numinosity—issues an ethical resistance; it penetrates my capabilities and is an addition to the inevitable stagnation of appearance, and thus it reaches the edges of my capabilities. My own possibilities are called into question by the Other. In *A Thousand Plateaus,* Gilles Deleuze and Félix Guattari (1987: 167–91, 170–71) distance themselves from ethical imperatives such as these—in inter-bodily lived worlds from face to face—and, in their rhizomatic thinking, declare the face in the narrower and broader sense to be a "bunker-face" *(visage-bunker),* a surface, map, long, rectangular, triangular, with lines and wrinkles, a strange system, "horrible and magnificent," amidst the abstract mechanical *assemblages of power (pouvoir).*

Within their semiotics, the face is a *white wall*—significance—and a *black hole*—subjectification—vacant as a *projection surface,* filling up as a *locus of resonance* by way of an individual unconscious. "The face is Christ." Year Zero, the creation of the face. "The face is the typical European." (Ibid: 176) The face is also hand, chest, stomach, penis and vagina, thigh, leg, and foot. Between capitalism and schizophrenia, the face cannot be separated from fetishism or erotomania, it is re-coded: as the inhuman in the human, as the close-up, as the lunar landscape, with its uninhabited white surface and gleaming black holes, in vacancy and barrenness, towards the disciplining of bodies, from organic layers to layers of significance structures and subjectification procedures, on a surface riddled with holes, in despotic and authoritarian assemblages of imperialism: *a face, what horror* (Ibid: 190). To mix semiotics, the face because a mask that hides nothing but elevates everything, is no longer bound to a body, an available subject, a prior signifier—because the face *is* the mask itself.

Moreover, the face is politics. According to Deleuze and Guattari, the face must be escaped: through *becoming-clandestine* (Ibid: 186) in realms of A-significance and A-subjectivity, in deterritorialization in real life and in art, as a person slips into a face even before possessing one, in bi-univocal relationships with the face of the Other, in elementary units, as "a man *or* a woman, a rich person or a poor one, an adult or a child, a leader or a subject, "an × *or* a y." (Ibid: 177) Beyond ontology or existence, the human body *gains face* in *becoming,* within the immanent plane, which also includes the image: a close-up is a face and "the affection-image is the close-up," as Deleuze (1986: 87) explains in *Cinema 1.* After all, the close-up can be treated like a face *(visage),* it is viewed in the face *(envisagée),* and it obtains a face *(dévisage).* As a reflective surface and an intensive micro-movement, it is a face in and of itself. It is situated between perception and action, contains the inherent power to separate the image from space and time in order to demonstrate pure affect in expression, in acts of de-framing *(décadrage),* from process to passion, as with the actor Maria Falconetti playing Joan of Arc in Carl Theodor Dreyer's 1928 silent film.

The film isolates the facial expressions and the physiognomy of the visible human being (Bálasz 2001: 48-49) without placing them in context, without a counterpart; they function as the "white wall" and "black hole," empty projection surface and locus of resonance to be filled, *carrier of affect.* The film actor's face is also a face-object, as Roland Barthes (1972: 56) writes about the face of Greta Garbo, which is worthy of admiration; and with its makeup, with its "snowy thickness," it equates, in turn, to a mask: not painted, but plaster-like, closed-off, ephemeral, compact. Garbo's face is a temptation to a *total* mask, as the archetype of a human face, out of which only the eyes tremble, vulnerable and wounded, "black like strange soft flesh, but not in the least expressive." (Ibid.) Yet specifically, in the film Barthes is speaking of, *Queen Christina,*[1] the face does receive a counterpart, in the interplay with antagonists, in the shot/counter-shot technique, in conversation, conflict *(Auseinander-Setzung,* literally "taking apart"), it becomes the *carrier of the gaze,* which is

1 Rouben Mamoulian, dir. Queen Christina. USA: Metro-Goldwyn-Mayer, 1933.

more than a written face, a vacant surface, than white paper and black inscription (Barthes 1981: 122): Garbo as an actor (in the social theory sense) risks her exterior, she becomes, paraphrasing Susanne Valerie, the vivid venue of the fragile exposure of a human being who seeks a mask in her appearance — in front of the eyes and ears of Others: observation, reflection and control *as well as* nature, sensibility and passion allow the voice to rise, the words to pause, the sounds to vary, and the limbs to move. Thinking and experience construct and structure the "laboratory of existence" whose existence has always been a human one, in which the actor can become a "study *subject*," in part via her *faciality* and *corporeality*, as a carrier of existence, affect, and gaze, as an *eccentric* face-subject (Granzer 2011: 96).

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A BRIEF AVATAR-NETWORK THEORY

DIETER MERSCH

ACTOR-NETWORKS AND OTHER OBJECT-ORIENTED ONTOLOGIES

For more than two decades, Bruno Latour's actor-network theory has dominated discourse in Germanophone cultural and media studies (Latour 1999, 2005b: 21–26, 46–50, 79–82). Originally conceived for sociologically-informed research on science, particularly in the field of science and technology studies, actor-network theory engages with scientific research and its historical changes by analyzing networks of actors. Actor-network theory defines the category of actors in a broad sense to include scientific objects, experimental systems, theories, instruments, methods of measurement, archives, scientists, and their assistants. It focuses not so much on the theory of science, which explores how scientific objects are constituted and the application and genesis of scientific theories. Rather, it is more of an ethnography of the sciences, of how they organize their practices and establish global networks. Actor-network theory seeks to uncover *all* "agents" that have a part in the scientific process. Instead of restricting itself to intentional action, the theory understands "agents" in the weak sense of "co-actors" situated in a field of forces. For actor-network theory, scientific praxis is rooted not in an ensemble of ideas and intentions but is a function of a web of relations that provide the foundation for what is called "objectivity" in different historical periods (Daston Galison 2007). In short, the approach aims to critique the fantasy that science is a wholly transparent, controllable process and not a complex field of diverse, sometimes contradictory elements and their relations, which only bring forth that which is to

be defined as a scientific object when they come together. The basic claim underlying this critique is that facts are always forged out of and connected to a series of factors that can never be identified in their entirety. The result is that scientific constructs remain resistant and contain blind spots that relativize their validity. Accordingly, the "networks" *(réseaux)* made up of connections, objects, technologies, and people precede that which constitutes science, its facts, and its discourses.

The success of actor-network theory and its transfer from science and technology studies to cultural studies, media studies, and aesthetics and art has been remarkable. Having garnered the status of its own paradigm, it has established itself as one of the key theoretical approaches, and this despite the fact that alternative philosophies of praxis — one prime example being that of "artistic research" — gained an upper hand around the same time. The transfer to other disciplines was not clear-cut, though. Distortions, misunderstandings, and exaggerations were all part of the process, particularly as concerns the theory's main category, the "actor-network." The expression is *one* word: there are not, on the one hand, networks and, on the other, actors or agents as separate entities that then fuse together into a conglomeration. Rather, the term signifies the heterogeneity of actor-relations itself, with the "nodes" represented by subjects or objects and the "edges" represented by relations that have their own individual affordances and power to act. Thus, we are not dealing with neutral units, but with closely interwoven "actants." Among them are things in particular arrangements or concepts in the context of discourses, materials, and experimental practices and settings, all of which only attain their "effectiveness" in their mutual interactions. They are all inseparably bound up with one another, and it is the unique relations that generate divergent effects that can rarely be reconstructed identically and thus must be analyzed as a whole. Thus, actor-network theory is a type of relativism that demands that we think holistically and place a whole assemblage of mutually interacting elements in relation to one another. These elements' constellations mark a break with classical modes of description because the purpose is not to identify causality, but to deduce "scripts" out of interdependencies and connections.

However, standing in contrast to its application in the history of science, one of the common vulgarizations of the theory in cultural and media studies and research on artistic practice is to shred the network of relationalities and extract actors out of it as self-standing entities. The term is then often turned into "actors-network theory," where the silent insertion of the "s" underscores the mistakenness of the approach. Because while the expression "actor-network" emphasizes the network, the "actors-network" emphasizes the actors, which, for their part, advance to equally acting agents in a mixture of human and non-human elements. This underscores their individual autonomy and frees things and technologies from the yoke of anthropocentric paternalism. And it grants objects an almost magic power, as if they were living beings vested with their own powers of attraction and sometimes even intentions, thus systematically blurring the line between the human and non-human. Latour himself suggests this reading when he speaks of an "object's activity," even if in the same breath he says that objects can, at most, only be "mediators" or "intermediaries," explaining that "specific tricks have to be invented to *make them talk,* that is … to produce *scripts* of what they are making others — humans and non-humans — do." (Latour 2005b: 79) This is particularly true of autonomous technological things and their assemblages, and especially objects with artificial intelligence that are seemingly capable of making their own "decisions." Examples include self-driving cars, diagnostic expert-based systems, robots, communication assistants, and avatars. But these artefacts do not act "autonomously," at least not in anything more than a metaphorical sense, because they always act within the predefined framework of a program and probability functions.

In philosophy, the theory has been further developed and radicalized by the New Materialism and object-oriented ontology. Especially prominent here is the work of Graham Harman, whose "speculative realism" has had spectacular success at schools of art in particular (Harman 2007: 171–206; 2018): "Something important is happening.

In our profession, there have never been better times to be young." (Bryant, Srnicek, Harman 2011: 1) Harman goes well beyond Latour and asserts—in an anti-Cartesian state of "naivete" (Harman 2011: 5)—that there is a principle equality among all entities, whether it be humans, animals, viscous substances, atomic particles, or, as Harman adds somewhat flippantly: "diamonds," "rope," "neutrons," "pens," "eyeglasses," "tools," "beating hearts," "fire," "Egypt," "armies," and "football stadiums." (Ibid., 5–7, 20, 37, 142 passim) He writes: "Everything both inside and outside the mind is an object," (ibid.: 143) objects that maintain the most diverse relations with one another, most of which, however, we cannot observe. The picture of the world painted here is similar to that of a giant living organism in the mode of vitalism, but with the significant difference that its reasoning is purely speculative. For Harman, it is apparently wholly indifferent if two balls hit each other or if a person hits another person. This denies every difference, every hierarchy, every distinction between *actio* and *re-actio,* because in principle, things, plants, and other entities have the same rights as the people who make judgments about them. The main target of critique is what Quentin Meillassoux calls "correlationism," (Meillassoux 2011) to which he ascribes the claim that everything that we can know or experience of the world is always already shaped by our thinking, concepts, judgments, and categories and is thus subjectively determined. In contrast—and in distinction to actor-network theory, which would not dispute this claim—speculative realism, of which object-oriented ontology is a species, asserts that there is an "ab-solute" reality independent of humans in which all events are placed on equal footing, whether they simply affect humans or whether they occur "between" humans or "between" objects. This confronts us with *two* givens: the objects, on the one hand, and networks of relations, on the other. The "humanist" uniqueness of humans is consequently erased. The only thing that matters are events that, regardless of their ontological origins, have relations with one another. The philosophy rules out the possibility of privileging any particular perspective. On the whole, the approach is inconsistent, because it is only possible to make this claim by simultaneously reinstituting the primacy of the human thinking about these issues, thus surreptitiously reviving nothing other than the old anthropocentrism.[1]

POST-HUMANIST FANTASIES

Anti-humanism or post-humanism in this form, whether it be vulgarized actor-network theory or object-oriented ontology, clearly remains a type of humanism. But the following will test its plausibility by analyzing a special example: the avatar, or more precisely, avatar-human constellations. Alongside cyborgs, robots, digital characters, and other seemingly "autonomous" technological constructs, much discourse in media and cultural studies is all too ready to grant agency to avatars—as purely simulated beings that have no other existence than as mathematical models. This, it is alleged, dethrones the hegemony of humanism. However, the claim is implausible, because the artefacts themselves have a humanist origin. After all, as Martin Heidegger (1977) writes, technology is only the tip of the iceberg of the metaphysical disposition that he criticizes in his "Letter on Humanism" as a human fantasy of power. But the claim serves to multiply the number of such agents and counterpose the primacy of human activities with more "autonomous beings." The point is to relativize the precedence of humans by showing that they have to deal with heterological agents that might even be better than them in certain respects. Many theories of art have gone beyond this technological post-humanism by ascribing agency to every material, thing, medium, or technical apparatus; however, these efforts often remove the objects from their context and do not reposition them in a network of relations. Props, paints, slides, special effects, light, computer animation, and animated figures suddenly gain the capacity to formulate intentions and intervene in and shake up the action—just like smart phones and other programmable smart things evoke emotions that can bind people to them.

1 See my critical remarks on this movement in Mersch 2016, 2019

Such fantasies were once the exclusive object of theories of schizophrenia. If one reads them as evidence of objects' "capacity to act," the question arises as to how one defines "capacity" and "action" in this context. Certainly, all kinds of objects can influence us and our environment, but this was not even controversial for classic theories of causality. The thing is *causa* of an effect, whether it be as the initial spark of a chain reaction or as hindrance, as an Odradek that always pops up where it does not belong or, conversely, is noticed in its absence as a "tool." As *absentia,* it has a further effect, because we experience the significance of a thing more gravely the more we miss it. Ascribing "agency" in the sense of a "capacity to act," however, goes well beyond this, because it concerns autonomy, intentionality, and thus independence. Certainly, things, other living beings, and "nature" affect us and sometimes *make* us act or change our plans, such as when they stand in the way and counteract our intentions. But they only do this because *we* had plans and then only by negating those plans. At other times, they require from us sophisticated techniques of diagnosis, methods of making visible and processing. Indeed, their vulnerability, fragility, and finitude are integrated into technology itself. They generate breaks and "force" us to behave in certain ways or to repair and revise. But the subtle difference between this conceptual insight and the various "actors" theories lies in the fact that the former works with terms like *re*-action, *change, temporality,* and *negation,* which are all associated with contingency, decay, and resistance. Thus, essential here is not a—positively connotated—"capacity to act," but, at the most, negativity.

But resistance does not necessarily constitute *capacity,* which is only true when the resistance is *wanted* and conflicts with the rules in protest. A tree blocking a road, a dam diverting water, a turnstile, an opaque structure that cannot be understood, and mutating viruses—none "want" anything or refuse to respond. Rather, they condition *our* actions such that we *always already have an essential part in these events.* This also means that we cannot subtract *our* role from *their alleged actions.* At the same time, the word "compulsion" says too much, because the issue is not how things and objects obstruct our actions, but is simply a matter of formal necessities. The discursive confusion lies in the fact that "actor" is a pretentious word that commits a category error when it is taken literally to suggest an activity that cannot be distinguished from passivity. What is more, passivity comes "earlier" than activity, which makes the "actors" perspective generally deficient, as will be shown in more detail.

The *adequacy* of such ascriptions is another issue, particularly as concerns the modality of *relationships* that we enter into with *others* as well as with that which we are *not.* This includes technological artefacts and artificial beings that we ourselves have created in order to busy ourselves with their automatic activity. They only seem to approximate us, touch us emotionally, subvert our affects and senses, provoke us, or engage in dialogue with us. The (ultimately cybernetic) theories of cultural and media studies as well as theories of the new "ecologisms" (Morton 2016) and parts of artistic practice consist in the notion that interactive technological media will enable us to overcome humans' monopoly on action, because current and—even more—future technologies will compel us to accept the destabilization of our dominance by developing their own affects, reading our emotions, intervening in our actions, applying our wishes, making decisions distinct from those made by humans, and thus being equal "playing partners." (Hayles 1999) But is it possible to call this "cooperation"? Do technologies really enter into "partnerships" with us in the genuine sense of the word when they interact with us? And are the "decisions" they make more than just algorithmic, randomized re-actions? These questions are particularly important for the many avatars that are conceived as simulative representatives of ourselves or other, potentially malevolent characters that serve as assistants, advisers, fictional bearers of identity, and much more. The following thus discusses whether we are justified in speaking of "power," "cooperation," "partnership," "foreignness," and "malevolence" when talking about such artificial beings, or whether these are not just concealed anthropomorphisms that fly in the face of the emphatic claims made by object-oriented ontology and actors-network theories, thus revealing that they revive the "humanism" that they themselves seek to fight against.

RELATIONALITY VERSUS RELATABILITY

The crux of our critique lies in the reality of "social" relationships and questions about their reduction to networks and formal ties. The comparison between avatars and interhuman relationships underscores the intensity of this issue. First, it should be recalled that network theories are rooted in mathematical graph theories that only know two types of entities: "nodes" substitute objects, which have no ontological predetermination and thus can be treated as empty containers that can hold anything, while "edges" represent the connecting lines and can stand for all types of relations. They, too, are "empty spaces," determining in advance only the number of connections, but not their modality. Mathematical models abstract from their content, so that it appears irrelevant if the "edges" connect humans or non-humans. After all, crucial is the structure and its qualities, not experiences like social trust, communicative reciprocity, and interhuman interactions. Moreover, are sociality, cooperation, and understanding—in short, the specific *connections between humans and their own capacities* that were once associated with concepts like *koinonia* and *religio*—at all compatible with avatars? Can "living together" in the sense of political "participation" be compared with the mere sharing of a common space between *us* and technological and other artefacts and images, artificial beings and simulacra? What does it mean to "encounter" an avatar—perhaps even an avatar of myself as at once a sort of alienating self-encounter? What does it mean to look at "them"—or, better, "it"—in the eyes, to be affected by "them," to respond to "them"? And how should we view two avatars' or robots' "love" or "sexual attraction" to one another? Should we feel shocked, disgusted, amused, tricked, excluded, entertained, or betrayed? Can they, as our own inventions, be treated as equals and granted the same rights? Or must we distinguish between "relationships," which are always constituted by a "pull," (Mersch 2010) and the diagrams of a network? In other words, do connections—and especially technological connections—not always constitute a deficient mode of relating that has interhuman sociality as a precondition? Must we not have already entered into social "relationships" in order to understand them?

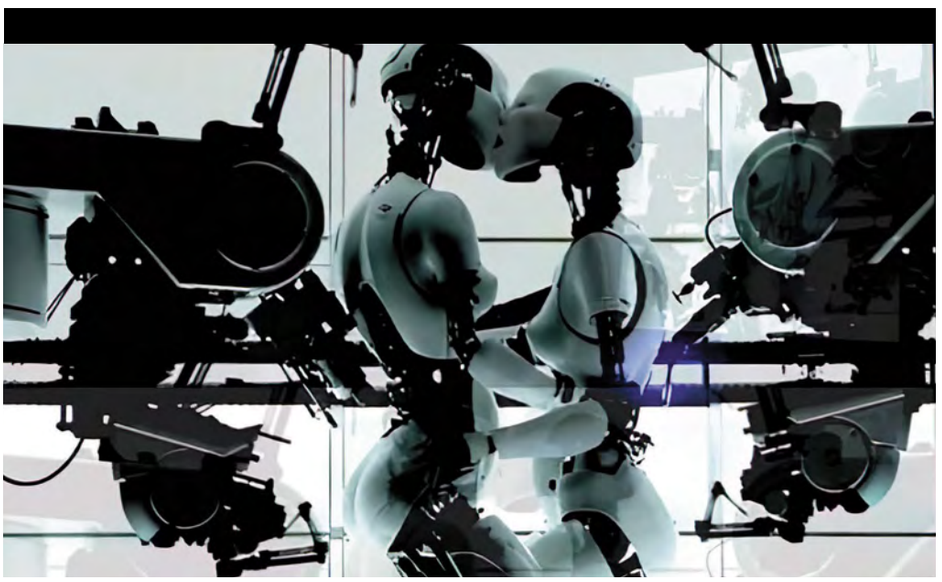

FIG. 1
CHRIS CUNNINGHAM, MUSIC VIDEO FOR BJÖRK, "ALL IS FULL OF LOVE" (1999).

As far as these questions are concerned, one might say that avatars serve as extreme tests of what it means to act autonomously, be an actor, and develop relationships with non-human artefacts. The diagnosis offered by object-oriented ontology seems clear: we have no privileges over artificial entities, which are not just simple passive objects. Nothing gives us privilege, greater status, or a sense of superiority over them. And yet, the assertion that there is equality between us and them involves a distortion, because the problem of fictive interactions with avatars is not the alternative between hierarchy and equality. Rather, the

decisive issue is the basic incommensurability between these relations themselves. This is to say that human relationships and artificial relations are incomparable, because the former signify an *event* within a complex social order that is defined by alterity, while the latter just derive from a network of positions that must always be embedded in social systems but cannot be larger or more expansive than them. Certainly, one can argue that ecologies precede economies and that environmental totalities encompass social totalities; that sociality is nothing without the "nature" that makes it possible. However, ecologies are always either described through graphic, mathematical structures, which remain neutral, or their semantics—and thus their anthropomorphic quality—are already a derivative of the social world. There is no ecology, no nature from which humans and their sociality can be removed, because this sociality always precedes the analysis of nature. The defense of ecology, too, is a social task that applies the experiences of the social to environment and nature, because they are a precondition for our living together. The philosophical weight of these reflections consists in the insight that the social is even constitutive for our *ability to distinguish between objects and humans at all* and for the fact that, where this distinction is missing, the *sense of the genuine sociality of the human* disappears. Without habitual social relations, we could not only not interact with one another, but would also not be able to interact with things and thus avatars. Indeed, we would not be able to relate to *anything at all,* not to speak of thinking, understanding, telling stories, creating art, and doing science. One of the possible consequences of this critique is thus that equalizing the ontological will lead to manifest sociopathologies that destroy the difference between relationship or relatability and relation.

Versions of actor-network theory prominent in media and cultural studies and art theory evidence this dissolution of difference, because they subtract precisely those aspects of the approach that are interesting for social science. With respect to research praxis, Latour's actor-network theory is a social philosophy. Its brilliance consists in conceiving of actors as *network figurations* in which human relationships are always active. In contrast, post-humanist appropriations of the theory only function by abstracting from social reality. While Latour sought to delimit the social, the post-humanist version of ANT completely erases it. In defense of his own work against some of his followers and critics, Latour wrote an article in 1996 titled *On Actor-Network Theory: A Few Clarifications plus More than a Few Complications* in which he clarified that the postmodern appropriations of ANT were misled because "actor-networks" should be understood as an "ontology" with a genuinely "networky character" and not as a conglomeration of ontological things (Latour 2017). Actor-networks are *active interconnections,* not interconnections of "actives." The widespread talk of the agency of things that allegedly necessitates a redefinition of the relation between subjectivity, materiality, and alterity, thus rests on a systematic false reading. The question of who or what the "actors" are is incorrectly formulated, because there are only connections and co-constitutions, whereby the prefixes "co-"and "con-" are primordial. And every network has its own shape that must be reconstructed. Thus, no avatars exist as isolated artificial identities that, in the guise of "simulated subjects," undermine "humanism," just as surprising "encounters" with them are unthinkable. Rather, there are only "avatar-networks" comprised of an ensemble of computer scientists, software engineers, displays, settings, discourses, visualizations, data flows, internet connections, online communities, narratives, fellow players, and much more. These actor-networks are always already shaped by human structures, one reason being that they are human technologies. In other words, we "encounter" avatars at most in play settings, films, and virtual realities in which we already anticipate their presence.

Thus, Erich Schüttpelz (2016: 235) correctly claims that actor-network theory avoids "fixing artefacts, social organizations, and signs" as well as persons and things in favor of delineating foundational orders of relations and their processes. From this perspective, agency is a function of "chains of operation" that should be characterized as "insistent transactions" and not as a function of autonomous decisions (ibid.: 237–238). As a consequence, we are confronted with the "postulate of the primacy of social and technological chains of

operation over the entities involved." (Ibid.: 237) Agency should thus not be attributed to individual actors, but only to the complexity of a relational arrangement. This also holds for avatars, which are nothing but aggregates and not "living" humanoid beings that we could enter into dialogue with on equal footing. Instead, their agency is constituted through at least three factors: first, programs of similarity that are gleaned from social processes, even if artificial intelligence drives them; second, the quality of being a technological artefact, which enable the adaptation of certain movements or reactions with the help of tools like motion-capture; and third, signs, which include data, drawings, and archives, so that they can only be understood and treated as objects of a relationship when they are viewed within *the whole constellation to which they belong:* "Actor-network theory—despite rumors that say otherwise—does not grant the persons, things, artefacts, natural beings, instruments, media, writings, images, and data centers that it describes a power to act or 'agency' of same strength, equal quality, same source, not even same status. Rather, all that actor-network theory demands is the equal consideration of the 'agency'—the power to act—of artefacts, signs, persons." (Ibid.: 242)

The specific charm of the theory, which has had such an enduring effect on cultural, media, and art studies, thus derives from how it brings together the whole heterogeneous ensemble of relevant aspects that require an implicit "ontography" to be described. Their relational scripture, which has much more in common with Derrida's theory of writing than most proponents of actor-network theory are aware, thus excludes every attempt at ontologization or the conception of agency as a quality of objects. Instead, as Schüttpelz writes, agency unfolds in an "operative process," (ibid.: 243) which is to say that it comes out of a processual co-relationality that is similar to a "graph" of forces like in theories of physical force fields. In this sense, the non-human elements are more akin to the *pathic* than to *poiesis*. Applied to avatars, this means that they are hybrids in which relations and their relata are ordered together, but in such a way that the latter only obtain their specificity through the former. They are heterogeneous associations in which the *copula* is the most important part, such that the connections mobilize an entire apparatus that governs interactions with them, their possibilities, and their limits—in short, their operability. "One difficulty certainly concerns vocabulary. The equation of actors with the relations their actions place them in and their power to act, the equation of 'actors' with 'actor-networks,' the hyphen between actor and network, and the fact that every 'network' (every action relation) can appear as an actor that enters into other networks—all of this promotes an activist view of actor-network theory." (Ibid.)

These points underscore that the human element cannot be removed from the network. The purpose of actor-network theory is thus the assessment of often forgotten *non-human elements* in the sciences, particularly ethnography, cultural philosophy, and social theory. Latour (1993) thus explicitly talks about a "symmetrical anthropology" that would remain anthropology and not get lost in the inconsistencies of object-oriented ontology. At the same time, this anthropology's claim to "symmetry" reveals the necessity of the interdependency of its elements. Just as no human, social, or cultural facts can exist without relations to non-human things that they will have always already transformed, so too are there no non-human facts that have not already been influenced by human actions. Thus, the "human element" is just as dependent on things as the things and technological artefacts are on human and interhuman relations. Alongside Latour's many examples, the pistol makes this point especially well. The pistol is a piece of technology, but it is nothing without the person who holds it and uses it for good or evil. One cannot call it a neutral object that freely stands to human disposition, nor can one call it a thing that is itself an actor. One can only speak of various human-weapon relations that generate a specific type of violence and are violent in every constellation. The issue is not to decide to engage in a violent act, but to understand the different modalities of violence that are produced by different relations. Thus, we are not dealing with innocent, isolated things nor with individual humans who only activate these things through their practices. Rather, we are dealing with impenetrable

"knots" of various actions and potentials to act. Actor-network theory, with its emphasis on chains of operation, thus contains a moment of opacity and contingency, which is what makes it so powerful for the analysis of both the sciences and of art and society.

AVATAR-NETWORKS

The implication is that avatars only have *being* at all where networks are already laid out and mapped. Avatars never appear and cause trouble on their own, but only do so in the context of human-avatar associations with their technological, semiotic, and computer foundations, which include all the parameters of simulations and the scenes that correspond with them. They parasitically feed on the primacy of social relations that they rely on and from which they have "learned" through machine learning. The fascination that we have for animated figures and quasi-living dolls carries a trace of this. They embody a vitality that we know is only staged, but that captures our attention precisely because it evidences a similarity shot through with dissimilarity and thus forges a distance to our everyday experience. In other words, having an encounter with an avatar implies already being wrapped up in an avatar-network that remains subordinate to the sociality of interhuman relationships. As a result, unexpected face-to-face encounters with avatars seem impossible because, unlike with ghosts and other apparitions, avatars never appear as autonomous *agents*. After all, attributing agency to them would mean extracting them from their networks and elevating their status to one of autonomous beings. But in the end, they are predictable, even if they simulate unpredictability. This is why—like with robots—fear is not the dominant emotion in our experience of avatars, an insight that stands contrary to the "uncanny valley" hypothesis. Rather, dominant are neutrality, contempt, and distance, because, as both neuroscientific experiments and experiences with cinema show, there is always a certain degree of familiarity that we can easily decipher and enjoy.

FIG. 2
AVATAR: THE WAY OF WATER (2022)
© DISNEY

FIG. 3
3-D AVATAR MODEL
HTTPS://LEEGOONZ.WORDPRESS.COM/2010/02/13/W-I-PREAL-TYPE-3D-CHARACTER-MODELING/

Thus, the foreignness of the avatar is a myth, just like the fear of humanoid aliens that conspire against us and take over in the world of science fiction. It is a myth because they are part of the history of technology, which witnessed varying prototypes and degrees of perfection before human attributes were directly programmed into them and we began to integrate them into our perception. Thus, avatars always originate in an analogy, which means that they will never attain the status of alterity that would be necessary to recognize them *as* other others, neighbors, or equal cooperation partners. They are more like mirrors without enigma because we know how they are made and what they really are: *mathematical simulacra*.

Thus, despite all of its theoretical productivity, there is something lacking in actor-network theory, because the primacy of networks does not allow for a distinction between relationality and relatability. Like the graph theories that stand at the foundation of network theories, relations denote formal classifications that distinguish only between "nodes" and "edges," but do not necessarily differentiate between the *modes* of classification that connect the networked elements to one another in varying ways. In short, as avatar-networks demonstrate, the deficiencies of actor-network theories lie in their *lack of an adequate concept of modality that would relativize the concept of relation* and, above all, *enable a separation between relationship and relation,* which is crucial for all forms of sociality. Cooperation, neighborliness, friendship, and dialogue can hardly be sufficiently described with the neutral concept of relation, and they do not adhere to the formalism of mathematical functions. This is why interhuman relationships are different than human-machine or human-avatar relations and relations between things, necessitating that a fundamental asymmetry be charted in the symmetry of networks from the very beginning. This is likely a reason why human-avatar relations, particularly in games, always have such a stereotypical form and why *fighting*—the quintessential form of binary relations—is dominant in them. At the same time, it helps explain why these relations rarely deal with political conflict, in which diplomacy and its nuances are of utmost importance, or love relationships, which traverse pretty much all emotional registers.

FIG. 4
SCENE FROM *MORROWIND: THE ELDER SCROLLS* (2017).
HTTPS://WWW.BUFFED.DE/TESO-THE-ELDER-SCROLLS-ONLINE-SPIEL-15582/TESTS/MORROWIND-REVIEW-1229438/

Another way of expressing this is that actor-networks and their relational diagrams are similar to homogeneous webs that are wholly determined by the logic of their graphs, while social structures constitute asymmetric "fields" in which identities, belonging, and the elements that forge or break community are most significant. This brings us to a momentous claim, because from a philosophical perspective, the reductive versions of actor-network theory cast doubt on nothing less than the *primordial sociality* in theories of agency and replace sociality with a primitive copy. While they seek to revive social philosophy by proclaiming the symmetrical equality of all relations, they are faced with the "ab-solute" difference

that follows out of all other relational differences. Responsible for this difference is, beyond Derrida, not the "scripturality of writing," but the never-ending drama of interhuman relationships. It is these relationships that produce differences between humans, technological artefacts, objects, and artificial beings, such that where these differences are neutralized, the *sense for the social* and thus for *genuine human sociality* gets lost. Is this not why Chris Cunningham's video for Björk's song "All is Full of Love" (1999) is so unsettling? And, conversely, is it not symptomatic that the pathologies of the social can be perceived in the mythical fantasy worlds of computer games and animated movies, whose archaic narratives are — not for nothing — defined by violence and heroism, as if they were just directly channeling the energy of the social? The reason for this shallowness probably consists in the fact that the theater of algorithmic models without genuine decisions is not able to do much more or much else.

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PUPPETS, PETS OR DEPUTIES. ON THE RELATIONSHIP BETWEEN ACTORS AND AVATARS

GUNTER LÖSEL

INTRODUCTION

The practical part of the research "Actor and Avatar" explored the shifting relationship between actors and avatars, between self and other, that comes into focus when avatars enter the scene. One approach to this wide field we chose was from the perspective of acting, assuming that the expertise of stage and camera actors would help to describe new phenomena of identification or alienation with avatars. In this article, we sketch out the theoretical framework exploring the similarities and differences between acting in a traditional sense versus acting through an avatar and describe our experimental design of face-to-face encounter with an avatar.

The core questions remained: Can we consider "avatarization" as a different, possibly new kind of acting? Possibly one which could be described as digital puppeteering? Or as a different kind of mask work? Is it a distinguishable character or role-play, for which theatrical concepts help us to understand an uncommon form of "embodiment without a body"? Can we understand the avatar as an extension of the body, something like a prosthesis? Or should we consider this form and appearance as something completely new, not comparable to anything we are familiar with as actors and performers?

Avatars are a new phenomenon in theatre in two ways. The first concerns the appearance of avatars on the *digital stage.* While the internet has been referred to as a "virtual stage" for quite some time, new technologies make this metaphor more striking than before, allowing players and users to enter the virtual stage in real-time with a virtual body that reacts to the body of the player/user — much like an actor enters the theatre stage. The second concerns the appearance of avatars on the *theatre stage,* including real-time interaction with other characters and the audience. This is a new technical possibility, which creates a considerable change from the common use of video and projection on stages. Meanwhile it is possible to give the avatar the appearance of liveness and presence. An avatar can react to both fellow actors and the audience. In "The Tempest" by the Royal Shakespeare Company,

the character of Ariel appeared as a real-time avatar since 2016.[1] Although the aesthetic possibilities of its use might be limited,[2] the proof of the possibility of an "acting" avatar has certainly been made.

WHAT IS AN AVATAR? THE TWO-WORD CONCEPT

There is still no phenomenology of the avatar and no theory of perception of avatars, between image and affectation, motion and emotion. Our project entered a new field, where the avatar is seen primarily as a virtual surrogate of persons (Pennig et al. 2012: 59), or where the scientific discussion revolves around criteria of difference between agent and avatar (Bailenson et al. 2005), mimesis (Lanier 2001), or questions of interactivity and acting in virtual worlds (Bente et al. 2001, Slater et al. 2000, Günzel 2012). Further, comparisons were drawn between avatars and tokens, puppets, cartoons or robots, as especially in Klevjer (2006). It is not questioned, however, if a personal or person-like relation *with* or perception *of* avatars is possible at all, how far it reaches, what experiences of alterity anticipate in this relation, or if a basic separation persists between humans and avatars.

We can differentiate between the traditional, hinduistic concept and the modern concept connected to the digital world. Both establish an idea that we refer to as the "Two-World Concept", which means that there are two separate worlds with a boundary that can be transgressed only through transformation of the phenomenal body.

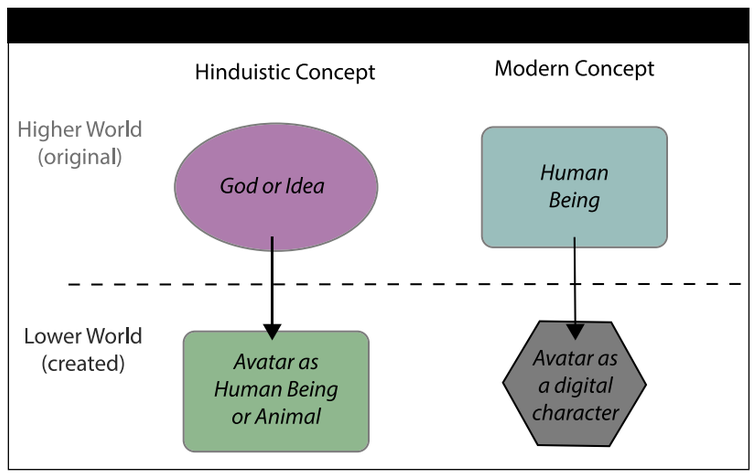

FIG. 1
THE TWO-WORLDS CONCEPT OF AVATARS

More specifically this sets up a concept of a "higher" and a "lower" world, thus describing the transgression into the lower world as a "descent," while crossing the border in the other direction would be an "ascent." This hierarchy is the only specification of the relationship of the two worlds and has important implications, since the lower world is somehow dependent on the higher world and, when in conflict, the higher world will be given priority. For example, when a computer gamer feels hungry, the immersion into the world of the game will decline, he or she will shift attention to the real[3] body and consult the refrigerator in order to eat something.

This leads to a basic analogy to theatre. Just as the player in a computer game is entering the digital world of the game through the avatar, the actor is entering the fictional world of a theatrical play through his or her character. The hierarchy of the worlds might be comparable, both virtual world and fictional world being *created worlds* that depend on the real world.

It is also worth noting that the modern concept of the avatar puts the human being in the place of a deity, creating some confusion of who is in control, as we will elaborate below.

1 https://www.youtube.com/watch?v=MML0EXW6s38 (10.12.2016)

2 http://arstechnica.com/the-multiverse/2016/11/tempest-review-real-time-digital-avatar-performance-capture/ (09.12.16)

3 We will be using the word "real" quite a lot in this essay, though being aware that it is dependent on philosophical assumptions that cannot be discussed in this context. In opposition to "virtual" or "fictional", the term here refers to a world that can be perceived through a multitude of senses, can be supported by intersubjective exchange, is permanent and independent of mental states. As Phillip K. Dick put it: "Reality is that which, when you stop believing in it, doesn't go away". https://en.wikiquote.org/wiki/Philip_K._Dick (04.03.2017)

ENVIRONMENTAL VIEW ON THE AVATAR

The two-worlds concept leads to the conclusion that the relationship between player/user and avatar also includes a relationship with the *world* of the avatar. The avatar is not only a puppet sitting on a shelf looking pretty or scary! It is always part of a fictional or virtual environment, and conceptualizing the avatar without this relationship provides only a limited view. The aim of an avatar is to enable participation in a world that would otherwise not be accessible to the player/user. So the avatar must be seen in the context of the world to which it grants access and the operations that can be performed through the avatar in this world.

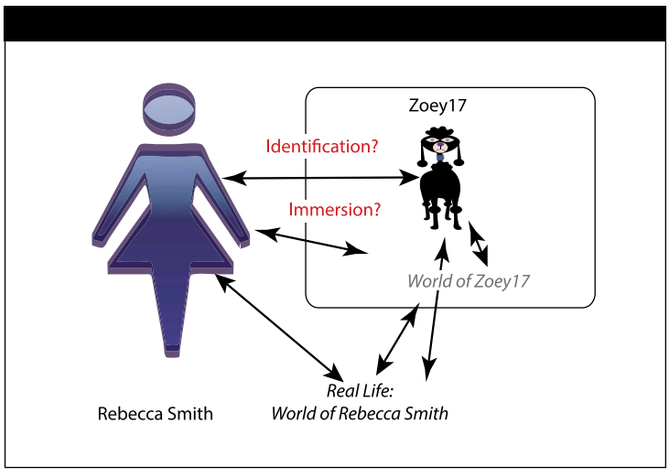

FIG. 2
ENVIRONMENTAL VIEW OF THE AVATAR

As the illustration shows, the relationship gets quite complex when we consider the environmental aspect of the avatar. The way in which an avatar can operate in its virtual world is very important, as the "cursor theory" highlights below. It seems reasonable to distinguish between two processes: (1) a process of *identification* with the avatar as a digital object and; (2) the *immersion* into the avatar's world, story, fiction or game. Though interdependent, these might be seen as two analytically separate processes of avatarization. What we have called "relationship" is, therefore, a varying mixture of identification and immersion.

In accordance with this idea, the theatre-researcher Ulf Otto speaks of two different functions of the avatar; an operative function and a symbolic function:

> *An avatar therefore is not a scheme or picture, that overlays the appearance of reality, but it is a deputy in two senses: On the one hand the avatar is an* operative *deputy, providing impact within the model as a functional element. It gains its appearance while being performed as a figurative practice, that can be described as analogous to the embodiment of a character through an actor—even when the avatar is not so much emerging in the differentiation of actor and audience but in the differentiation between human and machine. On the other hand the avatar appears as a* symbolic *deputy of this figurative practice through which it is generated.*
> *(Otto 2013, 109. Translation G. Lösel)*

So, the processes of identification and immersion rely on the way the player or user bands together with the operative and the symbolic function of the avatar. Otto parallels this process with acting, placing his main focus on the operative aspect. One can conclude that *in virtual and fictional worlds it is not so much what we are, but what we do, that connects us with the avatar.* This establishes the emphasis on the *performative* side of the process: To inhabit an avatar, the player has to *act*. Identification (or whatever one might call it) will arise from these actions, and the operations that a player performs when first controlling the avatar will be crucial for the subsequent relationship. The focus will therefore lie on the first few minutes of the encounter with the avatar, when the player/user discovers how to perform the avatar by trying out all possible operations.

THE STAGE-CHARACTER AS AN AVATAR

In theatre, this process would be called "identification with the character," where the actor not only reconstructs and re-enacts the actions of the character within the play, but also builds up a spectrum of possible actions and emotions that seem apt for the character, though they are not part of the play. Often this is done through in-character improvisations, confronting the character/actor with unforeseen situations and finding out how he or she would behave in these situations. The actor accesses a state of mind and body that is different from his or her everyday self. This duplication of the actor into a phenomenal body, which is his or her own body, and a fictional body, which is the body of the character, has been at the very heart of acting theories since Denis Diderot's "On the Paradox of Acting" (1770–73). Some of the intense experiences of theatre and acting can be retraced to this paradox of being "two in one."

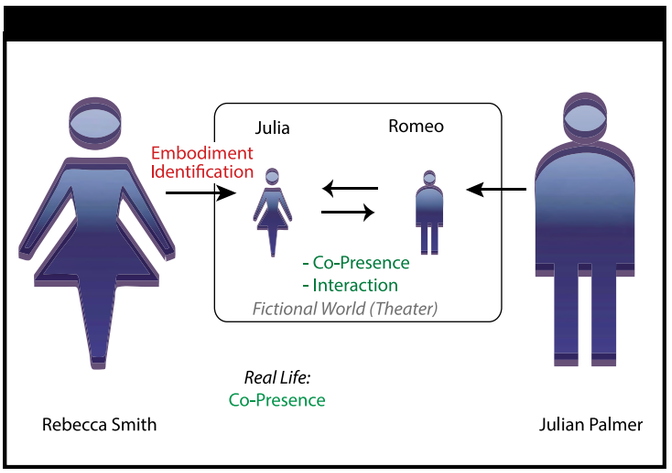

FIG. 3
ROLE PLAYING IN THEATRE
(SOURCE: LÖSEL ON THE BASE OF HORBELT 2001)

Using this model, one might conceive the character embodied by an actor as an avatar that allows him or her to enter the fictional world of a play (fig. 3):

The actor will transform into the character by *embodying* it and—depending on the acting school he or she comes from—by *identifying* with the character.[4] In the fictional world he or she will be able to *interact* with other characters, in similar ways to how they would interact in the real world, using voice and body to convey meaning. At the same time, the actor stays in *co-presence* with the other actors and the audience in the real world. Transferring the visualization to the avatar, the relationship looks similar (fig. 4).

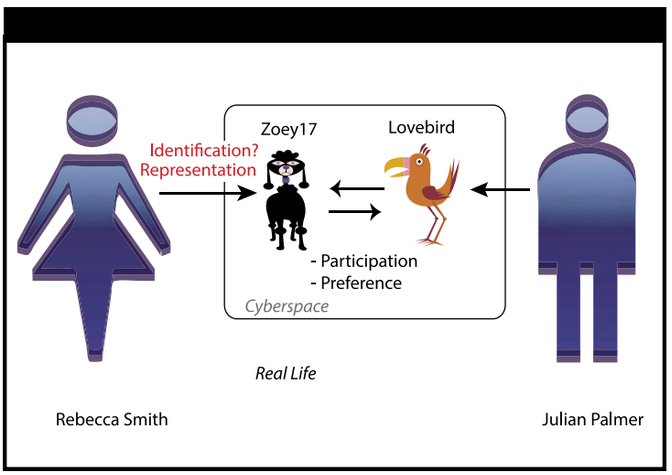

FIG. 4
ROLE PLAYING IN CYBERSPACE

The principal difference is that there is *no co-presence in the real world*. The players (or users) will not share the same time, space or focus of attention. Even if they are in the same room at the same time, there will be no real-time interaction between them. When it comes to interaction in cyberspace, the main feature is not co-presence but *participation*, because, as Otto (2013: 99) points out, presence in the computer world is not "just there", it has to be actively generated by participation. A reader of a chat who does not add a comment, is not present for the other participants, while an audience member in theatre is present even when he or she is similarly passive. This main difference, then, is that interaction in the virtual world is dominated by the *choice* to be present by participating or not to be. This choice leads to another aspect of interacting avatars, the *preference* of interactional partners, which means that we are free to choose.

In the virtual world there is *no embodiment* in the conventional sense because there is no body. Instead, the player/user can choose an appearance that is far beyond biological and

4 Of course, postdramatic and modern forms of theater have questioned the concept of identification and character altogether, but these forms are neglected here, because they have no connection to the idea of an avatar.

physical restrictions, which leads to infinite options that are independent of the real body. The relationship between the real body and avatar is very loose. Still there are limits as to what appearances we can relate, as Pindar Saygin points out (Saygin 2012). How human-like does an avatar have to look? How human-like should its behavior be? In any case, there is an aspect of *representation* that defines the relationship between player/user and avatar; *representation* does not necessarily mean *identification*. In most cases—e.g. dating platforms—there is probably no identification. Until now, research has focused on the theme of choice: Which avatar would people choose to have them represented accordingly? Future research should take into account the process of identification. Computer players recount a state of identification with their avatar only after hours of playing, so one can assume that identification comes with operating the avatar.

All in all, encounters through avatars have some similarities to theatre, but the degrees of freedom are much bigger, both in choosing one's own appearance/role and in choosing the interaction. The avatar—like the stage-character—is a form of duplication, but in an externalized form, transgressing the border into another world much more radically than the character stepping into the fictional reality of the play. The avatar is an out-of-body duplication, leaving the body of the player or user behind when entering the other world.

SYMBOLIC VERSUS OPERATIVE DEPUTY

(1) SYMBOLIC FUNCTION

Until recently, most research has focused on the symbolic function of the avatar and the question: Which avatar will best represent me and which one would I choose in order to be recognized by friends? Under this premise, individuals will choose an avatar that is similar to their own appearance but has a degree—20–30%—of "avatarization" towards an average face. People seem to find themselves best represented when the avatar is similar, but not identical. Instead they appreciate their avatar to be around 20% morphed in the direction of an average face, a representation that they evaluate as being objectively very similar to their own face (Blom et al. 2014) (Epley and Whitchurch 2008). Of course, the avatar is quite often not used in order to be recognized, but rather in order to hide in anonymity. This is not a representation of the self in the digital world, but rather a disguise, yet still it can be summarized under a symbolic function.

(2) OPERATIVE FUNCTION

Umberto Eco uses the example of a broomstick that becomes a horse in the frame of play (Eco 1977: 209). Obviously, there must be some physical features that make the broomstick apt for the symbolic function. It has to have something like a "head", be long, and somehow "hairy" in order to represent a horse. But more importantly, the player must be able to handle the prop in certain "horse like" ways, e.g. sitting on it, moving it around in the room, jumping and so on. The symbolic function has to match the operative function. Similarly one could describe the symbolic function in the terms of J.J. Gibson's "Affordance Theory": an affordance is the possibility of an action on an object or environment (Gibson 1979).

The operative function thus does not rely solely on the symbolic function but can be independent. A consequent expression of this thought is the "Cursor Theory" that was introduced by James Newman in order to describe the player-character relationship in video games (Newman 2002). He rejects a character-based understanding of the avatar. Identification with the avatar, in Newman's view, has little to do with identifying with the visual features of an avatar, but with the operational function; agency and control are the main

qualities of this relationship. It is not what the avatar looks like that makes it possible for the player to "inhabit" it, but what the player is able to do through the avatar. In theatrical terms, one might speak of a performative relationship. It is only there when acted out; it has no ontological status beyond this. In acting there is no parallel to this kind of relationship because the stage relies on phenomenal bodies. Drawing on the—quite radical—cursor theory, the relationship between player and avatar would not need embodiment at all.

QUESTION AND METHOD

In order to find out more about the operational aspect of the process of inhabiting an avatar, we set up an artistic experiment. The artistic and experimental partial project relates to the concrete picturing model of the comparative situation outlined above. The framing of the relation between actor and avatar, which is still very general, was then further reduced to perception of facial expression. In this way, voice, physical movement, behavior and other bodily actions were excluded from our focus, which therefore relied solely on facial mirroring. The experiment concentrated on "significant" expressions, such as "terror" or "joy", thus reducing the focus further.

As a result, the specific aesthetic arrangement rested in comparing three groups of experimentees—professional actors, acting students and amateurs—and their mirrored expressions recorded in real time. To do this, we used real-time face tracking software. In the general sense of an "open circuit" of a self-reflexive arrangement, the recorded "avatarised" facial features were technically "alienated" (see pictures). Simultaneously, the "acted" mimic in the performers' mirroring was recorded in two lines of facial expressions: joy as expressed by a human and expressed by the same person as an avatar. The experiment resembles Nam June Paiks' *TV-Buddha* (1974), although now translated into the realm of computer animation and held open by an immediate responsive structure; the actor becomes his own spectator and has to learn how to deal with his alienation. The question within the artistic experimental structure, therefore, lead specifically towards the respective actors/performers, their reactions, possible learning, self-training and conditioning.

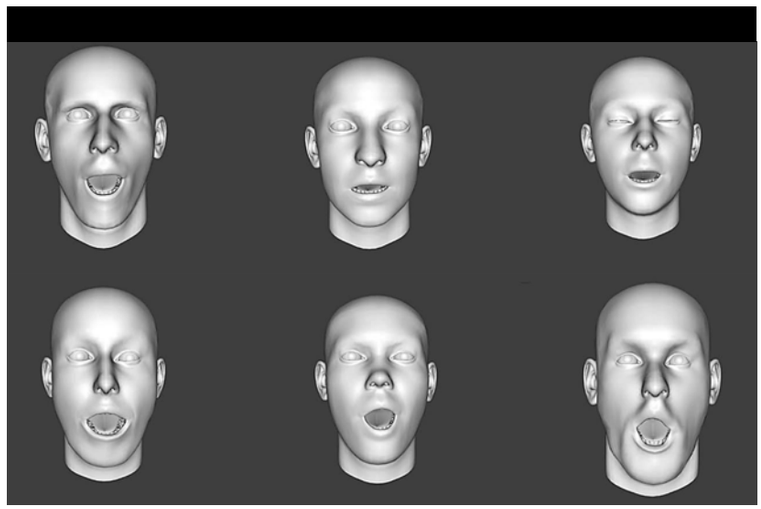

FIG. 5
AVATARIZED FACES OF ACTORS

RESULTS: METAPHORS FOR A NEW RELATIONSHIP

Metaphors are common in the literature on avatars and several of them derive from the field of theatre. The emergence of metaphors can be understood as an attempt to embed a new phenomenon into concepts already known, trying to find images that fit the subjective experience. In what follows we sketch out these metaphors and discuss their connection to acting.

PUPPET

As Otto points out, one of the earliest metaphors in the history of digital agents is the puppet. It is mentioned in 1984 in the context of the computer game "Habitat":

> *You were reaching out into this game quite literally through a silver strand. The avatar was the incarnation of a deity, the player, in the online world. We liked the idea of the puppet master controlling his puppet, but instead of using strings, he was using a telephone line.* (Otto 2013, 108)

Referring to marionettes, this metaphor has strong resonance in acting theories, where the marionette has been considered as an ideal actor, as in Heinrich von Kleist's "Über das Marionettentheater" (Kleist 1978, orig. 1810) and Edward Gordon Craig's concept of the "Übermarionette" (Craig 1911). The main argument for the puppet on stage has been the absence of emotion and egoism, which, in the eyes of Kleist or Craig, ruin human actors' performances. The avatar might possess the same advantages, conveying more neutrality, innocence and less effort than the original actor. If the puppet can be seen as an adequate metaphor for the avatar, the limitations of expression must be considered an advantage rather than a disadvantage, which means that the more technical progress overcomes these restrictions, the less powerful the avatar will be as an actor. So, as an operational function, the puppet/avatar lives through its deadness, which evocates projections; the puppet has to be clumsy. Otto states that the metaphor of the puppet embraces the idea that the puppet is completely under the control of the player, while the avatar seems to somehow possess the player or user. Hence the avatar is much more powerful than the puppet.

MASK

Another basic theatrical concept that has been applied to avatars is the concept of the mask. Ever since, masks "can both conceal and reveal. They are agents of disguise and of disclosure" (Pitches 2003: 58). This brings up contexts of ritual, trance, and possession as well as concepts of theatre like the Commedia dell'Arte.

Through the mask, a new entity, often thought of as a God, will make its appearance and it can be much more powerful than the wearer of the mask. In acting theory, the mask has also been a metaphor for the process of being inhabited by the character the actor plays. The player gives up his or her personality in order to give control to the mask (Johnstone 1987). So, in this metaphor, the avatar can be thought of as an entity of its own, independent of the player or user. It has its own needs, thoughts and intentions, so it can be encountered like another person. It is an encounter through transformation. Mask and player don't appear at the same time, but in sequence; when the actor is there, the mask is not and when the mask is there, the actor is not. So, the metaphor also implies a complete identification with the avatar, but one that is limited by time.

PROSTHESIS

Rune Klevjer writes about the avatar in computer games and supports the metaphor of a prosthesis of a prosthesis:

> *The relationship between the player and the avatar is a prosthetic relationship; through a process of learning and habituation, the avatar becomes an extension of the player's own body. Via the interface of screen, speakers and controllers, the player incorporates the computer game avatar as second nature, and the avatar disciplines the player's body.*
> (Klevjer 2006, 10)

The avatar is thus considered an extension of the body, inhabited by the self in similar ways as the rubber hand is inhabited by the self in the famous experiment (Botvinick and Cohen 1998). This experiment also demonstrates that the integration of the rubber hand into the body-scheme is dependent on sensual stimulation — it is not just a cognitive process but can be actively evoked through clever manipulations of the perceptual input. The avatar could thus be conceptualized as a full-body prosthesis. There has been some experimentation, if the results of the rubber hand illusion can be transferred to full-body experiences (Metzinger 2015). This seems possible in principle, but the identification appears less intense. It is not so easy to trick the self into inhabiting a virtual body, so the metaphor of the avatar as prosthesis is not as strong as it seems at first glance. The avatar is able to operate in a fictional or virtual world and is separated from the physical body. Klevjer sees this contradiction within the metaphor:

> ***Which brings us to the final function of the avatar that needs to be pointed out: unlike an instrumental extension (a tool), the avatar does not expose our actual bodies to the environment; it only exposes itself, as a vicarious body.***
> *(Klevjer 2006: 96)*

This brings him to the conclusion, that the avatar has a double-nature: An avatar is an extension that is also a model (Klevjer 2006: 94).

MODEL

A model here is understood as a prop that can operate in another world like a fictional or virtual world, for example a toy car, a radio-controlled airplane or a drone. It does not matter if they are manipulated by hand or if they move by electrical engines, the main quality is that they "… are external in relation to us as participants and can be interacted with as autonomous objects. Their fictional significance emerges from this interaction." (Klevjer 2006: 77). Drawing on Kendall Walton's theory, Klevjer characterizes the model in fictional worlds as a "dynamic, reflexive prop". It is independent from the body of the player or user but allows him or her to enter the other world and to operate in this world, while staying safely in his or her own world. The control is usually total; the model has no autonomous life of its own. The typical model in this respect would be a radio-controlled model plane, which enables us to take to the sky even if we are firmly grounded on the earth. (Ibid: 88)

GAME CHARACTER, TOKEN, CURSOR

Game characters can be very abstract, like they are in board games; wooden cubes, beans, or coins will do. Their function is almost not representational at all, but mainly operative; they allow the player to locate him or herself in the world of the game and perform certain operations, but they have no, or almost no, phenomenal body. They can take the form of tokens or, in the digital world, the form of a cursor. The cursor theory stands for the most abstract concept of an avatar. In the experience of the player/user, one would expect no representation at all, only operations.

ROLE/CHARACTER

The avatar might also be conceptualized as a kind of role-play, with the representational aspect being the costume and make-up while the operational aspect would be the ways a character moves and acts within the fictional world. There have definitely been cross-overs between acting and digital characters, as Otto points out: There is a growing community of cosplayers, who strive to embody fictional or virtual heroes like Lara Croft (Otto 2013). Lara Croft also gives an example for a digital character that is later embodied by a real actor

(Angelina Jolie), while the voice always had been of real actresses such as Shelley Blond, Judith Gibbins, Jonell Elliot, Keeley Hawes and Camilla Luddington. There are also a multitude of examples of actors being digitalized through movement-capture and face-capture, giving life to animated characters on the screen.

The main difference is the fact that the body of the avatar is not subject to the laws of physics and biology; it can take shapes that are biologically impossible, it can fly, it can bend, it can transform, it can overcome time and space. Comparable experiments have been conducted by the dancer and choreographer Matt Romein, exploring limits of real-time avatarization when physical laws are no longer valid (Romein 2016).

If the metaphor of role and character does apply to the relationship towards the avatar, further questions arise: How far can one go beyond anthropological constants? When will the identification break? How far can we stretch the laws of physics and biology in order to allow some kind of "mental embodiment" or inhabiting the avatar?

Klevjer refers to a 3-level-model of the avatar by Linderoth (2005). According to this model the avatar manifests itself on three independent levels:

1. A fictive character that you can pretend to be, a role.
2. A piece of equipment, a tool which extends the player's agency in the game activity.
3. A part of the players setting, props which can be used as a part of the players presentation of self.

A similar 3-level-model has been suggested for actors (Schwind 1997), but while in the avatar, the levels can take distinct phenomenal forms; the actor has only one body that will act on all three levels simultaneously.

CUDDLY TOY, SECURITY BLANKET, THUMB

Finally, the avatar can be characterized as a transitional object in the way Donald Winnicott introduced it seventy years ago (Winnicott 1953). This concept is somewhere in the middle between prosthesis and model. The transitional object can be part of the own body (like the thumb) but the same relationship can be transferred to an outside object (like the cuddly toy or the famous security blanket of Linus in the Peanuts Cartoon). The self is projected into an object due to a psychological process in the child's development:

> *There is a wide variation to be found in a sequence of events which starts with the newborn infant's fist-in-mouth activities, and that leads eventually on to an attachment to a teddy, a doll or soft toy, or to a hard toy.* (Winnicott 1953, 91)

Winnicott gives a very precise description of this kind of relationship — and he also suggests that it is only valid in a certain period of human development:

> 1. *The infant assumes rights over the object, and we agree to this assumption. Nevertheless some abrogation of omnipotence is a feature from the start.*
> 2. *The object is affectionately cuddled as well as excitedly loved and mutilated.*
> 3. *It must never change, unless changed by the infant.*
> 4. *It must survive instinctual loving and also hating, and, if it be a feature, pure aggression.*
> 5. *Yet it must seem to the infant to give warmth, or to move, or to have texture, or to do something that seems to show it has vitality or reality of its own.*
> 6. *It comes from without our point of view, but not so from the point of view of the baby. Neither does it come from within; it is not an [sic] hallucination.*

> *7. Its fate is to be gradually allowed to be de-cathected, so that in the course of years it becomes not so much forgotten as relegated to limbo.*
> *(Winnicott 1953: 94)*

This also opens up a new aspect of the relationship towards an avatar, highlighting its psychic function. The avatar in this view serves a specific psychological need; it is a prosthesis of the self *for a certain time,* buffering the heavy emotions that occur in the separation from an important person (the mother). This emotional aspect might explain some of the aggression that is conveyed through avatars. It can also explain why teenagers identify with avatars so much, as well as why avatars somehow "wear out" and get boring when they have fulfilled their purpose.

PETS, COCKERELS AND TOTEM ANIMALS

The last metaphor for the relationship towards an avatar puts much more emphasis on the autonomous life of the avatar. When conceived as a pet, the avatar has an intense emotional connection to the original, it is almost a part of the self, but has its own needs, rights and intentions. It may be tamed, but only to a certain extent. Some avatars simulate this kind of relationship, like the Tamagotchi-toy that was introduced in 1996, the characters of SIMS, that can express recurring needs and intentions, or digital dating simulations like "Date Ariane' (Barnes), that demand attention and courtesy from the player/user/dater. The avatar as a half-autonomous being is captured by the metaphor of animals.

Otto references Clifford Geertz's description of the Balinese cockfight as a form of play, in which the men can take part through their cockerels (Geertz 2005). A very special relationship evolves, the men carry their personal bird around, cuddle it, feed it, boast about it and talk about it a great deal. The cockerel becomes a half-autonomous external deputy of the (male) self. In another context, the metaphor of the avatar as a personal animal also might include the idea of a totem animal, which is a personal agent in another world — popularized again in the idea of a "patronus" in the fictional world of Harry Potter.

The metaphor of the pet would indicate some autonomy in the avatar — but not really enough to consider it an encounter with the "other". Does a pet-keeper encounter an outer entity when relating to his or her pet? Or is he or she just projecting emotions, needs and intentions into a living object? The pet can be thought of as externalized part of the self that is kept in some kind of dependency and leading a sheltered life within the wider life of the keeper. The metaphor, as with other metaphors above, hints that the avatar is both inside and outside of the self. It is this double nature which makes it so hard to grasp. In our experiment, we provided metaphors for the participants, discussed them and added new ones to get an expert insight into this new relationship.

Which of the listed metaphors now characterize the new relationship between actors and avatars best? Our preliminary results are based on the observation of actors in interaction with their avatars and our own experiences while acting through an avatar.

1. OPERATIVE DEPUTIES:

The outer appearance of the avatar seems less important than the operations we can perform with it. No matter which avatar the actors chose and even how similar the avatar was to their everyday self, the main relationship developed through performing certain operations. This accounts to movements of the head, turning the head, nodding and opening the mouth, but even more to performing emotional expressions. Actors were very precise in noting the

avatars expressional possibilities and limitations, unsurprisingly, and the buildup of a relationship evolved through testing out these possibilities and the restrictions. Indeed, none of the used avatars could really satisfy the needs for subtle expression of our test-actors. So, while expressive operations seemed to be crucial for the actor-avatar relationship, it was also extremely sensitive to disturbances. Even small restrictions in emotional expression led to a rather big disappointment and disconnectedness. On the other hand, new emotional qualities were discovered through avatars, especially when they had an appearance as animals. This seemed to be highly inspirational for the actors and they immediately started to play and discover new means of expression. This led to an extension of interaction-time between actor and avatar. The simple measurement of time spent in play with a certain avatar probably could serve as a valid measure for the quality of the relationship between actor and avatar. Is seems to correspond with the emotional operations that can be performed through the avatar, which supports the hypothesis of the avatar being an operational deputy more than a symbolic deputy.

2. CONTINUOUS FEEDBACK:

The actor-avatar relationship is based on a continuous stream of operations performed by the actor and it ceases to exist as soon as the actor has no sensual feedback of the operations. The avatar is not a stable representation of the actor or a role the actor might play, as would be a puppet or a mask, instead it relies on permanent feedback-loops. In our setting the actors needed a real-time visual feedback of the avatar, provided by a monitor where they could see not only the avatar but every operation of the avatar. The relationship, we conclude, is fragile and depends on sensual feedback-loops. A third person view of the avatar — similar to looking into a mirror — seems to be a good setting for this, a first-person view is less effective. The identification with the avatar immediately fades, when this feedback is not provided. This result again supports the operational function of the deputy.

3. PROSTHESIS:

The avatar is a way to operate and gain impact, just like a prosthesis and it becomes part of an enhanced self of the actor, which makes the metaphor of the prosthesis most apt for this relationship. Still the metaphor of the prosthesis is too weak as the avatar is not only performing operations that are in the scope of the actor's bodily self (like a leg or an arm), it does not replace a function that already exists, but opens up new possibilities that are beyond human expressions. The actor-avatar relationship is most attractive in operations which the actor could not perform in their natural human body. Seen in this light the avatar becomes an extension of the self like a prosthesis but detached from the physical body while still connected to the body self.

This kind of relationship is new, so words are difficult to find. The term we are looking for will be somewhere between prosthesis and game character/token/cursor, leaving the signified object very free in its appearance but instead describing its operational possibilities. Accordingly on a practical and artistic level, processes of operating the avatar and thus possessing it or being possessed by it get into the focus. They can create an experience beyond biological limitations of our species and beyond the laws of physics.

POSTSCRIPTUM: POSSESSING AN AVATAR. OR BEING POSSESSED?

While the representational function of an avatar seems to indicate that we can possess the avatar in the way we possess a car or a dog, the operative — or performative — function implies bilateral influences. The operations we perform as an avatar — as operations we do in play — can affect the self; they reveal hidden parts of the self, disinhibit unconscious aspects and let them take control for a while. It is this revealing aspect of the avatar that makes it conceivable that the avatar can lead to *new* experiences, where the real self does not have access to, and thus change the player/user. So, the avatar is not only an instrument to mask ourselves but also to show ourselves in a way that we would not dare to "publish" ourselves and create experiences that are beyond our usual scope of experiences. In some respects, one can say that the avatar takes control of the player/user, possessing them as something that is much bigger than the individual's conscious mind.

As the operative function relies on the operations of the avatar within its world, story, fiction or game, in a computer game these options are highly determined:

> ***Because the rules need to be implemented by a computer, they need to be expressed in terms of an abstract, formal system. The central difference between games and computer games is that in the case of computer games, instructions are not instructions to the player directly but instructions to the computer. Consequently, the player cannot break the rules unless the computer can be manipulated or otherwise made to cooperate. This also means that the player cannot relate directly to the instructions without somehow sharing the point of view of the computer.*** *(Klevjer 2006: 56)*

Hence, the operative function of an avatar is different from an actor handling a prop because it is always predetermined by the omnipotent machine, leading to an identification with the machine as much as with the avatar. In the encounter of a player/user/actor with the avatar, *control* seems to be the prime parameter. The first gestures an individual undertakes when confronted with an avatar are usually gestures that show that the player has control and allow him/her to find out the degree of this control — shaking the head, moving the lips, grimacing, etc. — one might call them *gestures of possession*. Next the original usually builds up a relationship by showing emotions — smiling. Or even kissing the avatar — just as they would in a real encounter. Many of these gestures could also happen while looking into a mirror; in order to build up a relationship with the avatar.

Otto indicates that the control a player appears to have over an avatar might be illusory, because the possession might very well work in both directions. While the avatar makes the player feel potent, like a God, "… and makes him believe to control the machine, we might also ask, if in reality it is the machine that takes possession of the player." (Otto 2013: 115-116). In other words, the player/user will be changed by relating to the avatar; the relationship is not one-way. Otto stresses this backlash on the player/user and also suggests the idea of possession as a metaphor for the influence of the avatar on the player/user, drawing on anthropological research:

> ***In the same way as a mask-dancer the player is also a tool for the avatar and will be rewarded by a temporary sublimeness. So if the relationship between player and avatar can be understood through ritual contexts like the cock-fight, then maybe the practice of this play could be understood as a process of possession.***
> *(Otto 2013: 182)*

This leads to acting theories of ritual, liminal experiences and possession, often associated with mask theatre. Looking at the avatar as something the player seems to possess, while he or she really is possessed by the avatar, is a strange way of thinking, but it accords with experiences and theories of acting. The role — even when spelled out in detail as in scripted theatre — seems to enable the actor to create experiences beyond their personal scope through inhabiting a character in a fictional world. The new relationship to the avatar is mediated by the machine/the computer and the discussion above shows that one of the main features to be explored is the feature of control: Who is in control and who is possessed?

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ENGAGING CONSCIOUSNESS. TIME AND DURATION IN HOLLY BYNOE'S *COMPOUNDS*[1]

GABRIELLE A. HEZEKIAH

Holly Bynoe's digital collage series *Compounds* offers an experience of space, time and image that exceeds photographic representation. Based largely on archival family photographs and found materials, the series is a project that explores questions of displacement, loss, rupture and knowing.[2] The series seeks to extend ideas of the photographic object through an exploration of surface tension. Bynoe describes the work as a kind of "poetic engagement with the past"—a recognition that memories are false and family stories complicated—an attempt to reconfigure images and render them more complex (Ibid). Her process of digital manipulation involves high-resolution scanning and Photoshop to produce a layered image of subtraction and abstraction. The result is a peculiar experience of time that I suggest stems from duration and spatial organization in the creation of the work. The collage *Brian* is particularly striking in this regard.

The central figure in *Brian* is a young man in what appears to be a photograph from the 1970s. The young man is in swim trunks. There is a house in what would otherwise be a background—but it floats and does not appear to be part of the same scene. The writing in the top left of the image seems to come from an official text. There are palm trees. All except a disembodied brown leg are in shades of black and white—but two sepia "age spots" indicate the presence of the past. The brown leg is bent but standing and is set against a pinkish hue. Behind the leg is a horizontal line of what appears to be a paisley marker—a threshold tile of the type found in a domestic space. It partially separates the dense, tree-lined portion of the collage from the legs in stasis and stilled motion. In this way, the collage is divided not into quadrants but distinct yet overlapping spheres. The spaces between the trees rise up like tall buildings. One has a sense of fullness though not of immersion. There is a play on surface. The scratches seem hand worked. Below the feet—of young man and brown leg—is a scratched border. This border extends perpendicularly halfway up the young man's body. His feet face forward, slightly turned out. The elements of the collage are perhaps drawn from different locations and different times but they all seem to be happening now. The young man faces us in a present moment. It is a peculiar sense of time. This is an image *of* time.

I am interested in exploring the particular mode of consciousness that allows this image to appear to me as an image of time. I wish to examine that which appears beyond the level of representation and of which there may be no physical trace. Holly Bynoe's

1 Many thanks to Andrea Kunard, Cyndie Campbell, Ann Thomas and staff at the Canadian Photography Institute and the Library of the National Gallery of Canada for access to research materials.

2 Holly Bynoe, interview with the author, 15 November 2016.

Compounds offer a unique opportunity to consider consciousness as—and at—the heart of the image. While there are clear connections to the social and political in this work, such an approach does not address the encounter with the work's internal character. This character is both more and less than an experience of historical time—and it suggests an attitude of openness and engagement that allows for the dissolution of a purely historical time and recognition of one more fundamental. This fundamental time of experience is what I have set out to investigate.

THE SOCIAL FACT OF REPRESENTATION

Imperial is a collage that addresses what I would call the construction and inscription of the colonial subject. There is the photograph of a woman. The dress and hair suggest a photograph of the early to mid-20th century. The woman's face is half light and half dark. The passport conveying British citizenship—or subjecthood—is inscribed upon it. The light side of the face is covered by signs of empire such as the British coat of arms. The dark side is covered with the physical description of the passport holder and the island of origin—Bequia. This locates the holder within a Caribbean space. But this is perhaps an image of two women. The hair is precariously positioned—like a wig or the hairpiece on a paper doll. The eyes are not quite the same and the neck appears to move beyond the established contours of the body. This is an exercise in layering and contrast. The background is also divided by shade. The white dress and grey sky anchor the image. In the background are the sharp angles of metal towers, bridges or scaffolding and buildings that seem metropolitan. The original images are spliced and arranged to produce a representation of the colonial British Caribbean subject and her relation to empire.

FIG. 1

BRIAN (2010) BY HOLLY BYNOE

DIGITAL COLLAGE, 25 × 35 INCHES. COURTESY OF THE ARTIST.

While *Imperial* calls to mind questions of inscription and construction, *The Fordes* points to the constitution of colonial subjectivity. The main figure appears to be a sartorial representation of colonial respectability and the outline that of a colonial gentleman. But he is built up and constituted by male and female figures of varying shades, all dressed quite formally and facing forward as if for official photographs. Bynoe seems to have subtracted the original colour of the gentleman's face, adding disembodied faces and figures in its place, and the visage of colonial respectability is filled in with an undeniable blackness that almost exceeds its bounds. The pink hair frames a face that is stoic but jagged. There is the sense of an emerging timeline—of generations being built into a colonial figure—and the exposure of this edifice as the underlying black skin beneath Fanon's white mask. *The Fordes* presents a corrective to history, illuminating a series of relationships that might otherwise go unacknowledged.

Where *The Fordes* presents a dense stack of constitutive subjectivity, *Pedigree* offers the deconstruction and unpacking of a portrait. Different in proportion from the others—40 × 40 inches square—this collage is clearly intended as a frame. We are drawn to read

this image as portraiture and also to see the posed subject as changing and receding over time. There are at least five photographs here. We see layers and expansiveness. Bynoe strips the constituent images and begins a process of separation that appears as a constellation—portraits floating in a galaxy of partially subtracted colour and sand-like granules, moving along an axis of personal memory. The frame within the frame also suggests the possibility of a mirror. The reflection is reminiscent of a series of nesting dolls. They pull away from the viewer. How deep and how far back is one prepared to go? In this collage, Bynoe seems to treat space as an unfixed backdrop for the unfolding of personal identity.

In describing his exhibition *Archive Fever: Uses of the Document in Contemporary Art,* curator Okwui Enwezor writes that it "delves into critical transactions predicated on opening up new pictorial and historiographical experiences against the exactitude of the photographic trace" (Enwezor 2007: 11). Similarly, we might read Bynoe's experiments as an interrogation of received historical narratives through a reworking of the photographic trace. Official and unofficial narratives, history and memory and the repositioning of the face and figure within a complex political and social context all point to thoughtful juxtaposition as key to the understanding of the historiographical and the self. Images from the archive not only bring the personal into the collective and the political—they actively embody them. In these images we witness the compounded, multi-layered and jagged edges of specific historical processes. These are representations of social facts, extending outwards from the photographic trace into the material and emotional web of imperial relations.

FIG. 2
IMPERIAL (2010) BY HOLLY BYNOE
DIGITAL COLLAGE, 40 × 60 INCHES. COURTESY OF THE ARTIST.

FIG. 3
THE FORDES (2010) BY HOLLY BYNOE
DIGITAL COLLAGE, 40 × 60 INCHES. COURTESY OF THE ARTIST.

But Bynoe's work also offers a more subtle space for interpretation. Beyond specific historical processes in these images lies a deeper relationship to the experience of time. In *Imperial,* I feel myself confronted with contemporaneous time. The time of empire is reflected in the time of the subject, the time of imperial writing and the time of the physical edifice. These are simultaneous happenings in interconnected locations. In *The Fordes,* I experience a time built up over generations, ascending and accumulating in the figure of the gentleman. It is a time that lies behind. The events are embedded. Finally, in *Pedigree,* I am faced with a lengthening of time as individual images are separated and made to occupy an ever-widening space that seems to extend to infinity. These descriptions approximate the temporal data that I experience as being presented immediately to consciousness. They are not specific to the historical processes addressed in the collages. They suggest a movement within the viewer that engages with movements internal to the images themselves. Such are the psychic facts that emerge beyond questions of the social and of representation.[3]

FIG. 4
PEDIGREE (2009) BY HOLLY BYNOE
DIGITAL COLLAGE, 40 × 40 INCHES. COURTESY OF THE ARTIST.

3 See Poivert (2016) for a discussion of images as social facts (representations) and the image as psychic fact of consciousness. I am indebted to his analysis. https://journals.openedition.org/etudesphotographiques/3594

THE PSYCHIC FACT OF CONSCIOUSNESS

> ***Either you keep to what consciousness presents to you or you have recourse to a conventional mode of representation.*** *(Bergson 1950: 66)*

The spatial organization within the image in Bynoe's work corresponds in some way to the presentation of time to my consciousness. It teases out an underlying tension that is articulated through gaps and absences (Archer 2011). These gaps and absences are rendered visible – and communicable — through an experience of chronological time. This is a time that can be found in *Imperial, The Fordes* and *Pedigree* but is virtually absent in *Brian*. In *Pedigree,* the figure moves away from the viewer, detaching from the surface of the image along an axis that draws the viewer in. It is a timeline. In *Brian,* the main figure approaches. And the space is chaotic. There is no discernible arrangement that points to "before and after". Space in *Brian* is always filled — with reflections, patterns or scratches — leaving no room for an interpretation of time in a conventional sense. What I experience in this image is not "time passing" (Massey 2016: 53) or a spatialized representation of time but time present and indivisible.

The spatialized representation of time is Bergson's manner of accounting for the quantifiable aspect of time understood as the chronological in our everyday. He enjoins us to attend to the immediate data of consciousness as presented through intuition and insight (Pogson 1950: vi) reasserting the primacy of experience and our inner life in the face of externalizing abstractions. He makes a distinction between real or concrete duration and mathematical or chronological time. Concrete duration is a lived experience of time as multiple and heterogeneous. It cannot be measured. Chronological time is a homogeneous time of discrete past and present. It is time "so to speak materialized" (Bergson 1950: 127). It is made up of boundaries. It is visualized and extends through space. I am suggesting that *Imperial, The Fordes* and *Pedigree* present us with space that delineates, shapes and quantifies our experience of time as contemporaneous, accumulated and extended. These collages are legible chronologically. But the figures in *Brian* are *de-spatialized,* inviting an experience of time as duration happening now, presented as psychic fact or mental image. It is time immediately presented to consciousness. In *Brian,* we no longer "project time into space" (Bergson 1950: 101). Instead, we encounter time as a form of fullness within the image.

By de-spatializing the original photographs and returning to surface, Bynoe has produced an arrangement that now has the freedom to express a fundamental time. The removal of conventional space returns us to duration. In this duration we experience time as indivisible. Bynoe has brought us to an experience of time in the archive that is not simply a representation or reconfiguration of the past. We come to experience what I call an *archival present* — a sense of fullness that is anchored in the intuition of a multiplicity of times happening now. This is facilitated by the time inscribed in the making of the image that then inheres in the final product. Bynoe describes the experience of time in the production of this series — hours of scanning and Photoshop — as reminiscent of an era when subjects sat for photographs.[4] In this way, we see digital technology facilitating an experience that we associate with earlier forms of production. I am reminded of Benjamin and the aura — but also of Susan Edelstein who writes of "the accretions of time layered into the multiple moments of the image" (Edelstein 2007: 11) in the long exposure of pinhole photography.

These are all elements of psychic fact — an intuition of time and experience of duration within consciousness. They move beyond representation to engage with the inner workings of the collage. They suggest an organization of consciousness that touches an organization inherent within the image. But if "duration [durée] denotes not a thing, such as time, but the always individual act by which time is retained and prolonged in consciousness" (Worms 1999: 96) how does my individual act of consciousness produce an image of time?

4 Interview with the author.

MENTAL SYNTHESIS AND THE IMAGING CONSCIOUSNESS

> *But the image is* a certain type of consciousness. *The image is an act and not a thing. The image is consciousness* of *something.* *(Sartre 2012: 144)*

Pure duration is "a process of organization or interpretation of conscious states" (Massey 2016: 53) and Bynoe's de-spatialization is a form of ordering and organization that brings this consciousness to bear. My sense of history — the sepia tones that suggest age and materiality — is dispersed in the image that *Brian* presents to my consciousness. It does not attach to a figure but floats on the surface of the scene. The text in the upper left suggests a memory of institutions — perhaps of education — but it is linked to concrete history only by an indirect line that moves across the human figures towards the tone near the bottom right. The disembodied leg is behind and beside the figure of Brian. It is not embedded and does not emerge. Brian is presented not as concretion but transparency. Through him I see palm trees and can barely discern a male figure facing left. Brian coming forward is a present stillness. My consciousness of past and present and the transparent link exists in the now.

Time retained and prolonged is not time extended. It is time synthesized and felt. The act by which this synthesis takes place sits just below the level of conscious awareness. There is an attitude of consciousness that is built up over the course of *Compounds.* It arises in the gaps between layers. It arises through a disjuncture between times — between surface and time. Elements of *Pedigree* drop out of the surface. These subtractions provide an opening through which consciousness connects. I am encouraged to meet — and to make — the image there. In *Brian* I synthesize prior experiences of divisible time with the time happening now. It is incorporated into past and present experience. I do not dismiss the existing photographs. They do not disappear. They serve as the ground that reflects this consciousness to me. The digital breakdown and reconstitution of the photographs allows time to emerge as the key subject and object of these collages. In Bynoe's reworking of surface and space, the photograph *as* photograph — along with the notion of historical time — is dissolved. In its place is a mental image — grounded in physical representation but experienced as a reflection on this movement into time. To rework a phrase from Cadava (2001: 38): "For a photograph to be read as a mental image, it must encounter a constellation of dangers, not the least of which is its own dissolution."[5] The space-time link — now loosened — opens itself up to a relation of consciousness.

For Sartre (2004: 85), the image is a "relation of the object to a consciousness". He conceived the idea of an imaging consciousness to account for the relationship between an external image, such as a photograph or a person present before us, and a mental image such as that experienced internally when we grasp a photograph intentionally or imagine an absent person in the mind's eye. Through an imaging consciousness the viewer of a photograph *animates* that photograph, producing a mental image. The mental image, therefore, is not conjured purely in the mind of the viewer but in contact with and reflection upon the photographic image as presented. It is synthesis. We see the photograph but it becomes both more and less than that which it represents. As Sartre writes, imaging consciousness is "consciousness of an *object as imaged* and not consciousness *of an image*". (Sartre 2004: 86) I am suggesting that in this work time itself becomes the object of an imaging consciousness. Bergson's duration considers the ways in which space and time as we habitually understand them differ from the *experience* of time — and Sartre shows how this experience of time might be *imaged* in consciousness. In *Brian,* in my act of duration, past and present are synthesized to become consciousness of a time that is without spatial artifice. This is fundamental time, as imaged. And the imaging attitude provides the mode of consciousness through which I produce it.

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5 Originally "For an image to be read (for it to 'enter into legibility' in the 'Now of its recognizability'), it must encounter a constellation of dangers, not the least of which is its own dissolution."

EMOTIONAL AMBIVALENCES. LOVING AND HATING A *TAMAGOTCHI*

MARTINA HEßLER

In her book "Alone Together", Sherry Turkle tells a story about actors and robots that she experienced when she was in Japan for the first time in the early 1990s. She reported:

> ***The problems of elderly loomed large. Unlike in previous generations, children were mobile, and women were in the workforce. Aging and infirm parents were unlikely to live at home. Visiting them was harder; they were often in different cities from their children. In response, some Japanese children were hiring actors to substitute for them and visiting aging parents. The actors would visit and play their parts. Some of the elderly parents had dementia and might not have known the difference. Most fascinating were reports about parents who knew that they were being visited by actors. They took the actors' visit as a sign of respect, enjoyed the company, and played the game.*** *(Turkle 2011: 74)*

The Japanese, as Turkle was told, valued the "predictable visits and the well-trained and courteous actors." So, she thought "If you are willing to send in an actor, why not send in a robot?" (Ibid.) She does not answer the question directly but makes her skeptical position very clear. Whatever one thinks about actors visiting lonely parents on behalf of their children, who do not want to or are unable to do so themselves, it hints at crucial aspects that are also significant in the context of human relationships to emotional machines:

First, both actors and robots, replace someone, in this case a specific person in a social relationship; but often social robots replace *humans as humans,* not as a specific person.

Second, the feelings of actors and robots are *simulated*.

Third, neither the actor nor a robot has a long and close intimate relationship with the person they visit. Therefore, they do not have a long history together. Disputes, contradictions, frictions, and family conflicts will not arise. The visits are friendly and pleasant. Everything stays under control, nothing gets out of hand.

Fourth, these actors bring joy to the elderly. The elderly are willing to accept the actors and do not view or bring up the substitution In a negative way.

From a historical perspective, the fourth point is of particular interest. Robots or avatars bring joy to people and people are willing to accept them. This has held true for robots for more than a century. Robots were shown at industrial fairs. They were presented as spectacles that astonished the audience. These early, very clumsy robots, like e.g. Eric, were able to bow and say a few sentences. Even though the range of sentences was very small and the audience knew that the robots had been outfitted with a record or a loudspeaker, they were enchanted and delighted by them (Bülow, 2007: 57–65).

Today, in the context of artificial intelligence, we are faced with a different category of robots. Nowadays, robots seem to be able to individually respond and react to their counterparts, which is quite different from their electronic-mechanical ancestors which endlessly repeated the same phrase to everyone, no matter whom they addressed. Thus, human-machine relationships have fundamentally changed.

To describe this change in human-machine relationships, Sherry Turkle spoke of a "robotic moment":

> ***This does not mean that companionate robots are common among us; it refers to our state of emotional—and I would say—philosophical—readiness. I find people willing to seriously consider robots not only as pets but as potential friends, confidants, and even romantic partners. (…) We are poised to attach to the inanimate without prejudice.*** *(Turkle 2011: 9f.)*

Turkle observed a clear difference to the 1980s. In the 1980s, she argues, "computational objects — robots included — should not be allowed into the realm of human relationships". However, "over the next decade, opinions shifted." (Turkle 2010: 4)

She calls this a change from a romantic moment to a robotic moment. While humans had — in a romantic attitude — previously defended the distinction between man and machine and emphasized certain peculiarities of humans, such as emotions, they were now ready to accept machines as friends. Mark Coeckelbergh (2017: 154) suggested that Turkle's definition of romance is too narrow: "There is no good reason to limit 'romanticism' to a defense of the human/nonhuman border or the alive/dead boundary." Others criticized Turkle for a conservative attitude and for sticking to dichotomous thought patterns since she considers friendships with machines problematic. She was blamed for not tackling the topic of social robots as "philosophical opportunities and challenges." (Gunkel, 2016: 198)

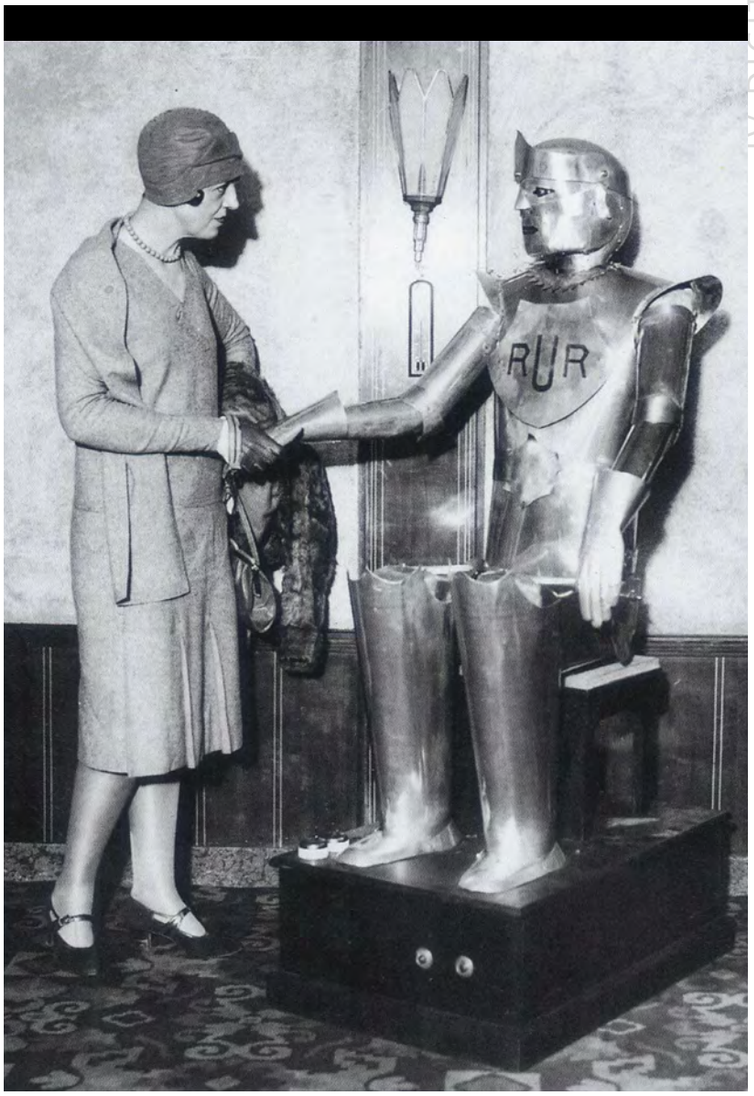

FIG. 1
ERIC, THE FIRST ROBOT (1929)

However, the concept of the robotic moment deserves further discussion, particularly from a historical perspective. Without doubt, humans' emotional relationship towards machines has changed during the last decades. The Tamagotchi will serve as a historical example. And while important research on social robots has reflected on the "other," (e.g. Gunkel/Marcondes/Mersch, 2016) this article will look at the transformation of objects

(from passively being handled to actively responding) and ask for the emergence of a new category of objects, namely that of responding objects. The decisive question here is what it is that makes these objects, such as Tamagotchi, so special, so appealing to humans.

EMOTIONS TOWARDS OBJECTS

Emotions towards objects are historically anything but new. For several decades, emotions towards objects have been the subject of *material culture research.* Authors such as Tilmann Habermas or Mihaly Csikszentmihalyi, to name only two scholars, wrote groundbreaking books about the attachment of humans to objects (Habermas 1996, Csikszentmihalyi 1998, also Downes/Halloway/Randles 2018). Csikszentmihalyi showed, e.g., how emotions are ascribed to things through memories of social situations or persons, beyond their possibly low material value and their perhaps questionable aesthetics.

Tilmann Habermas titled his book *Geliebte Objekte* (Beloved Objects). As a psychologist he underlined the central importance of objects for personality development and examined their symbolic value and psychological significance. He analyses their functions, and identifies self-portrayal, memory, empowerment or influencing of moods, e.g.

Objects are also fetishes (Böhme 2006), they are sacral objects (Kohl 2003), favorite objects, gifts. Often, objects are anthropomorphized. Cars or bicycles get names, they are seen as a family member. Car mechanics treat automobiles as organisms that need healing, as a recent study made clear (Geuenich 2020, Gericke 2020).

Piaget has already shown that children of a certain age interpret the properties of objects as the will of the objects. He investigated a childlike animism, which serves as an explanatory scheme for child development (Piaget 1978: 223). Early childhood animism does not distinguish between the living and the non-living. Children ascribe a will, wishes, conscious activity or even pain to things or to nature. Piaget cites the example of a little girl whose doll has indented eyes one morning, which causes the child great desperation. The little girl again and again asks if the doll is hurting (ibid.: 245).

Piaget also distinguishes between four stages of childhood animism (ibid. 207–240), without interpreting these stages as a strict sequence of stages clearly corresponding to an age. However, animism starts disappearing at around the age of eleven or twelve. Thus, Piaget describes the capability to differentiate between alive and non-alive, between things and persons, as the result of a process of childhood development that starts with the child's inability to differentiate and explain animism: "The youngest children are animists without being able to consciously explain their attitudes." (Ibid.: 226)

Nevertheless, this attribution of a will or an intention as inherent in objects is also found in adults. Piaget quotes Théodile Ribot, who observed in 1897: "By virtue of an instinctive tendency it is well known, though not yet explained, that man assumes that which acts or reacts to him has an intention, a will, a causality analogous to his own; his fellow men, animals, and such bodies as imitate life through their movements (clouds, rivers, etc.)." (Ribot 1897, cited after Piaget 1978: 270) Especially when things do not work as intended, adults also tend to attribute a will to them (Cf. Geuenich 2020). Piaget and Ribot's descriptions are of particular interest when the relationship between humans and emotional machines is looked at. Adults as well as teenagers, *know,* unlike children, that the interactive devices or social robots are not alive. But they treat them as if they had a will or were alive, as will be shown in the example of the Tamagotchi.

What we see here is the conscious ascription of a will to an object. Of course, emotional machines do not have a will of their own in the sense of a human will. However, these objects behave fundamentally differently towards humans than non-interactive objects do,

and in doing so emotional machines give the impression of having a will of their own. They "respond", they "answer," they interact. They develop in dependence on the other, they learn, they recognize the other, they seek eye contact. The objects are often designed in such a way that they appear lifelike. The toy seal "Paro", e.g., has wide eyes, a weight that corresponds approximately to that of a seal's, it can make beeping sounds. RealDolls or sex robots have a lifelike skin and weigh about as much as a slightly built woman, around 100 pounds.

Therefore, emotional machines constitute a different category of objects. In his study on the robo dog "Aibo", Christoph Scholz suggested to speak of "subject-simulating objects" (Scholtz 2015). Here he speaks of objects that are designed in such a way that they are to be perceived by humans as subjects, so that a subject-to-subject relationship is experienced. No matter if one agrees to speak of subject-simulation machines or not, emotions are *experienced* by interacting with emotional machines, since they *behave* subject-like. As David Gunkel (2016: 213) put it by using the example of the social robot "Jibo", this "is not just another instrument, like our automobile or toothbrush. But he/she/it is also not quite another member of the family (…). Jibo inhabits a place in between these two options." Although a car is by no means a simple instrument but quite often also its owner's pride and joy, it is surely necessary to reflect on this new category of objects, as will be argued in the following using the example of the Tamagotchi: Objects that simulate subjectivity. Objects that can be groomed by their users. Objects that change and evolve depending on how their users treat them.

ARTIFICIAL COMPANIONS OF THE 1990S: TAMAGOTCHI

In the mid-1990s, the Tamagotchi became extremely popular toys, and not only for teenagers. Launched in Japan at the end of 1996 by the Bandai company, 30,000 Tamagotchi were sold in the USA within three days in May 1997, and within three months over three million had been sold (Allison 2006: 163f.). One year later, the Tamagotchi were available in over 80 countries. The small, round plastic egg was brought to life by its users and then had to be cared for, looked after and maintained in order to "survive". It is considered one of the first interactive gadgets. Anne Allison called it the "ur-form." (Ibid.: 164) It was introduced as an artificial pet. However, as Anne Allison also emphasized, it was an object between all categories. A plastic egg that did not look like a pet, an object that simulated life but was artificial, a novel toy but also a "companion" (ibid.: 181). A Tamagotchi required feeding, entertainment, cleaning, rest periods with the lights turned off, and so on.

At the end of the 1990s, children enthusiastically nursed Tamagotchi but adults did so, too. Children took it to school, which in turn banned it from their premises. And swiftly, "tamagotchi-sitting" services taking care of the device during school hours were established. Children emphasized that they loved their Tamagotchi because they had to take care of it. Another decisive factor for children establishing the feeling of having an individual counterpart was that the Tamagotchi developed different characters depending on the individual treatment it received. The plastic egg could become a well-behaved, pleasant companion but also an uncouth, spitting something. This depended on the personal relationship to its individual user. (Ibid.: 172)

FIG. 2
TAMAGOTCHI FRIENDS-42805 ORIGINAL UNICORN.

Hate and violence occurred in the users' treatment of the Tamagotchi, as it is with many emotional machines. Of course, violence against things is not a new historical phenomenon either. People have pounded on their cars or kicked copiers for a long time. Teddy bears have also been maltreated. However, when emotional machines are involved, we see further disinhibition and intensification of violence. The robot "Hitchbot", e.g., was subjected to this. Hitchbot was

a hitchhiking robot that communicated with humans and was dependent on the help of humans. Many treated him like a friend. Others, however, destroyed him in the most brutal way, resulting in talk of vandalism. Reports from "Sexdoll" brothels show that customers expressed their worst violent fantasies: dead-looking women were to dangle from the ceiling, among others. And recently a robot has been developed to facilitate its user's expression of physically aggressive behaviors—it serves the same purpose as the punching bag in the past (Moorstedt 2019).

These examples serve to illustrate the continuity with regard to violence against things, which is, however, apparently lived out in an even more uninhibited manner. Simultaneously, and this is very important to note, it seems that violence against emotional machines is more difficult to be physically expressed. In the context of Tamagotchi, there was a talk of "tamagotchi abuse". It was debated whether and when to add a moral component and speak of abuse. Some suggested the following behavior was abuse: "Leaving your Tam's light on all night. Discipline it for the Wrong Reasons. Not Cleaning them up, etc."[1]

This need for rule-setting in the Tamagotchi user community shows that Tamagotchi were abused and tortured. Simultaneously, it shows that Tamagotchi were treated like living beings, or at least there were community attempts to establish moral standards, which followed the moral standards for treating humans. Furthermore, the topic "How to kill your Tamagotchi" was fiercely debated during the late 1990s. What is interesting here is that people reported that it was emotionally difficult for them not to take care of their Tamagotchi and even to "kill" it. Having a Tamagotchi as a friend meant caring for something that seemed to be alive but wasn't alive in a traditional sense. Users fluctuated between treating it as a living being or a lifeless thing. They had inhibitions about killing it and treating it badly. They discussed the category of "abuse". This all points to a hitherto unknown category of objects: A category of objects for which we have not yet found an adequate form of living with.

FIG. 3
HITCHBOT BY MICHAEL BARKER – HITCHBOT GOES TO THE FAIR, CC BY 2.0
HTTPS://COMMONS.WIKIMEDIA.ORG/W/INDEX.PHP?CURID=46300428

1 http://www.virtualpet.com/vp/future/abuse.htm (01.09.2020).

MACHINES THAT RESPOND AND HUMAN MOMENTS AGAIN?

Machines that seem to respond to their users' feelings, and which develop individually but also differently — depending on their interactions with their human counterparts — represent a novel category of objects that have begun to change the human-machine relationship. Emotional machines are adaptive, thus appearing more human or human-like. The 1990s therefore marked the beginning of a new human-machine relationship, which has become much more obvious today: Siri, Alexa, Paro, Pepper, sexdolls or the hitchhiking robot Hitchbot have begun to come every day objects that people interact with as a matter of course. As Turkle observed in the 1990s, humans seem to be willing to accept machines as their counterparts. However, it is not clear yet what exactly that means. Is a social robot a viable option as a companion? As an additional friend? Just an amusing toy which humans start to treat as if it was alive? Or do these machines become substitutes for humans, as Sherry Turkle claims? We seem to live in a period of transition during which novel objects emerge in the world, and during which humans' attitudes and emotions toward machines are undergoing changes. At the same time, we do not know yet how our lives alongside emotional machines will look like in the near future.

However, the current Corona crisis may have made clear how indispensable human relationships still are. During the pandemic, a bot was released that was intended to mitigate humans' loneliness. Robots were put in soccer stadiums in order to replace cheering fans. Sex robots seemed to be an alternative in times of closed brothels. But none of these robots were widely embraced. Therefore, one thing has become most obvious in this ongoing crisis: Machines are not welcomed to substitute for human social contact. The longing for visiting with friends and family, for creating community with peers as partners let the robotic moment fade away and made the current time a *human moment*. This also holds true for the elderly whose family members were not allowed to visit with them in their retirement homes. These seniors did not ask for robots, actors or avatars. They were waiting for visits by their relatives of flesh and blood. They longed for human emotions and human bodies, hugging them.

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CONSCIOUSNESS PERFORMED

THOMAS GRUNWALD, MARTIN KURTHEN,
HENNRIC JOKEIT, ANTON REY

CONSCIOUSNESS LOST

> *"What ho! my lord! –*
> *My lord, I say! Othello!"*

When Iago suddenly realizes that Othello has become unresponsive, he knows exactly what has happened:

> *"My lord is fall'n into an epilepsy.*
> *This is his second fit; he had one yesterday."*

He also knows that it would not be helpful to rub Othello about the temples because: "The lethargy must have its quiet course" (Othello, act 4, scene 1). He may be a villain, but Iago knows the patient, his conscious and his unconscious states very well. But the stage is not a hospital. In real life, physicians and neurologists do not know the patients whose consciousness they must assess in the emergency room. They do know, however, that patients may not be completely unconscious during an epileptic seizure. Instead, they may be alert but unable to communicate, or unable to say who or where they are because they cannot remember. Things become further complicated when the patient's consciousness must be evaluated in situations in which questions are consecutively posed to the left and right brain hemispheres. This happens during the "Wada-test," an examination that is sometimes necessary for presurgical evaluations of patients who suffer from medically intractable epilepsies but who may be cured by epilepsy surgery. In the "Wada-test," each hemisphere of the brain is anesthetized consecutively to test the language and memory capacities of the contralateral, awake hemisphere. If both hemispheres of the brain can communicate, each may answer differently. This can also happen during examinations of split-brain patients in whom the fiber system that connects both hemispheres—the corpus callosum—was dissected to treat otherwise intractable seizures. Such patients may be able to point with their left hand to an object that only their right hemisphere can see. When asked which object has been shown in the visual field of the right hemisphere, however, the patient's left hemisphere may just confabulate balderdash (see Gazzaniga MS 2000). There are certainly verbal reports that are indicative of consciousness, and fortunately, these are the verbal reports we deal with every day. It does seem, however, that not all reports can readily be taken as proof of "normal" consciousness. With so many caveats, it is necessary to ask whether there is just one kind of consciousness that can be impaired or whether there might be different forms of consciousness.

CONSCIOUSNESS DECLARED

Patients who have lost the ability to talk, write, understand, or read are aware of their impairment. The same is true for patients who are blind in one eye due to a lesion of the optic nerve. By contrast, there are patients who went blind due to lesions to their visual centers in the occipital lobes but are not aware of their loss, a neuropsychological condition called "anosognosia". Many lesion studies in patients with localized damage to certain parts of their cortices that cause circumscribed neurological or neuropsychological deficits have shown indisputably that the human brain is not an all-purpose problem-solving machine. Rather, it consists of multiple special-purpose modules—or "organs" as Steven Pinker (1999: 31) suggests calling them—whose activity may or may not be associated with conscious processes. Based on examinations of patients with perception deficits caused by cortical lesions, Michael Gazzaniga argues that:

> ***phenomenal consciousness, that feeling you have of being conscious of some perception, is generated by local processes that are uniquely involved with a specific activity (…)*** *(Gazzaniga 2011: 65–66).*

Some brain modules mediate conscious perception while others subserve processes to which we do not have immediate access. Phenomenal experiences cannot be immediately reported although they may be conscious. They are not declarative yet but may become so when language centers—which are normally situated around the Sylvian fissure in the frontal, parietal and temporal lobes of the left hemisphere—become involved in the activity of the "perception" modules, thus generating a "unified report" of their processing results. Gazzaniga calls this perisylvian language area the "interpreter module." It is the task and achievement of this module to make the contents of consciousness declarative to which it has access. If this theory holds true, there should be contents of consciousness to which the "interpreter" may not necessarily have access, which would therefore be non-declarative. (This theory also suggests that non-human and prelinguistic human animals should also have conscious perceptions without being able to report them.)

Why should the "interpreter module" try to give a unified report in the first place? The answer appears simply to be because it has been asked to. In fact, the interpreter module will always try to give a unified report even if it has no access to any relevant information, as in the above example of the split-brain patient *(cf.* Gazzaniga 2000, 2011). From an evolutionary perspective, however, such occasional errors are a tolerable price to pay for the advantages that a unified account offers to an organism with declarative consciousness. Based on the finding that all mental activity is mediated by parallel multitrack processes, Daniel Dennett (1993) assumes that the seemingly unified stream of consciousness that we experience actually consists of multiple parallel content-fixing events that are not necessarily contents of our consciousness but altogether represent a stream of multiple drafts of narrative fragments. Any such draft can potentially become part of our seemingly unified narrative but will only become so when it happens to be chosen in response to probing. Since a unified narrative helps to reconcile an organism's past and prospective future, it pays for this organism to probe itself constantly and thus receive a canonical narrative. Naturally, the narrative must center on the organism itself, whose "self" is thus (nothing but) the center of gravity of the narrative. Although there is normally only one such center of gravity for every organism, neurosurgical interventions can create disagreement (Dennett, 1992). If, for example, a complete callosotomy—the dissection of the large fiber-bundle connecting the two hemispheres of the brain—is performed on a patient with incomplete unilateral language dominance, an "alien-hand-syndrome" may occur. In this syndrome, when probed it is the "more dominant" hemisphere that provides the (more or less) canonical narrative, though it may complain about the involuntary actions of the ipsilateral hand. These actions

are directed by the contralateral hemisphere, which may have its own—non-declarative—center of gravity. That the non-declarative hemisphere can have its own intentions indicates that, at least for a while, it can tell its own story, with or without words. Usually these controversies can be resolved when both hemispheres learn to communicate via remaining interhemispheric connections and the detour of the environment. Eventually, the hemisphere that is in charge of declaring takes the lead. This may be a good "choice" for the organism because verbal narratives are less fleeting, easier to handle and can thus reach further into the past and the future.

A consciousness that can declare itself must have more at its command than conscious perceptions. Antonio Damasio (1999) calls this "extended consciousness," and its scope may span the individual organism's entire lifetime. Extended consciousness makes it possible to relate different experiences to each other and evaluate them in light of the organism's autobiography. To this end, it needs both an autobiographical and an extensive working memory. This working memory must have a large enough capacity to hold active memory contents for some time that define both the autobiographical self and perceptions, pictures or thoughts that reflect external or internal events, it is these two aspects that working memory must bring together. Damasio states that "autobiographical selves occur only in organisms endowed with a substantial memory capacity and reasoning ability, but do not require language," and he believes that "apes such as bonobo chimpanzees have an autobiographical self" (Damasio 1999: 198). Nevertheless, with language humans have a tool unprecedented in the history of consciousness that allows them to perform tricks with memories and perceptions of which no other animal is capable.

We have become so accustomed to, and dependent on, language that it is difficult for us to imagine a conscious mind without it. Perhaps Helen Keller's narrative can help us here. Helen Keller probably contracted meningitis in 1882 at the age of 19 months, which left her deaf and blind. Nevertheless, she earned a Bachelor of Arts degree in 1904 and, in 1908, tried to explain how it is to be conscious without language, hearing, and sight:

> ***Before my teacher came to me, I did not know that I am. I lived in a world that was a no-world. I cannot hope to describe adequately that unconscious, yet conscious time of nothingness. (...) I had neither will nor intellect. I was carried along to objects and acts by a certain blind natural impetus. I had a mind which caused me to feel anger, satisfaction, desire. These two facts led those about me to suppose that I willed and thought. I can remember all this, not because I knew that it was so, but because I have tactual memory. It enables me to remember that I never contracted my forehead in the act of thinking. I never viewed anything beforehand or chose it.*** *(Keller 1908)*

This is the narrative of a human mind before acquiring language. Because Helen Keller could encode lasting entries into her autobiographical memory, there is no doubt that she was conscious. By looking back, she can even make us *feel* how it is to act without having acquired language, sight, or hearing:

> ***I remember, also through touch, that I had a power of association. I felt tactual jars like the stamp of a foot, the opening of a window or its closing, the slam of a door. After repeatedly smelling rain and feeling the discomfort of wetness, I acted like those about me: I ran to shut the window. But that was not thought in any sense. It was the same kind of association that makes animals take shelter from the rain. (...) When I wanted anything I liked, - ice-cream, for instance, of which I was very fond, - I had a delicious taste on my tongue (...), and in my hand I felt the turning of the freezer. I made the sign, and my mother knew I wanted ice-cream. I "thought" and desired in my fingers. If I had made a man, I should certainly have put the brain and soul in his finger-tips.*** *(Keller 1908)*

This is a narrative of what Damasio calls extended consciousness, made declarative by subsequent language acquisition. If we, in a thought experiment, allowed this mind to see and hear, if we—to use Helen Keller's words—put brain and soul also in the eyes and ears, we can perhaps begin to sense how it might feel to have an extended consciousness without language. If, on the other hand, we imagine this mind without the capacity to create succeeding memory entries as foundation of an autobiographic self, we might come close to Damasio's notion of "core consciousness." This comprises simultaneous representations of a perceived (inner or outer) object and of the organism that does the perceiving. Thus, an organism with core consciousness perceives an object, simultaneously sensing that it is *itself* who perceives and not some other organism. It is almost impossible for us to comprehend because we cannot be conscious without language and memory. Or can we?

Consider golf or tennis pros who play their best game automatically, but start to lose when they cannot help wondering about how. Or consider actors or performers who cherish their "flow experiences" on stage but then start to wonder about their presence or impact on the audience and thus spoil the performance? "One of our enemies is the intellect", says Michael Chekhov about the creative process and the inspiration.

> ***Inspiration comes when everything is forgotten–the method, the technique, the part, the author, the audience, everything. Then the miracle happens. It happens that the play, the part, begins to exist independently of ourselves.*** *(Chekhov 1985: 55)*

These may seem to be far-fetched examples of experiences that most of us normally do not share. But how about driving a familiar route for a while and then suddenly realizing that you cannot remember the last minute or two, even if you had to turn left or stop at a traffic light? If you have a driver's license, you have probably experienced something similar. But were you really driving unconsciously? Daniel Dennett thinks not. He suggests that:

> ***You were paying attention to other things, but surely if you had been probed about what you had just seen at various moments on the drive, you would have had at least some sketchy details to report.*** *(Dennett 1993: 137)*

So it seems that expert athletes, artists, and drivers know exactly what to do, and how to do it best, in a non-declarative way. In the heat of the moment these experts may be very conscious in a procedural way.

DECLARATIVE BRAIN SYSTEMS

Language production and perception depend on the perisylvian cortex of the dominant (usually left) hemisphere. This area acquires its specific function in the first years of life during language acquisition. Before that, the human cortex is still flexible enough to allocate other brain regions to language functions if critical areas are damaged. A shift of language functions to the contralateral right hemisphere, however, can result not from a lesion of cortical "language centers," but from an early lesion of the left hippocampus, an area inside the temporal lobe that supports declarative memory (Weber et al. 2006).

Numerous studies have confirmed the importance of the hippocampus for declarative memory. Memory deficits brought about by damage to this brain structure affect memory contents that are accessible to conscious recollection making it possible to give an account of them (i.e. they are declarative). These memories include facts and events belonging to one's autobiography *(cf.* Squire and Zola 1996, Tulving 2002), and it seems that hippocampal

contributions to declarative memory are so important for language acquisition that the brain allocates language functions to brain regions within that hemisphere where the hippocampal system is intact. This is usually the left hemisphere, but can also be the right if the left hippocampus is sclerotic. Conversely, language is such an important tool for declarative memory that brain systems mediating language and declarative memory processes can be considered as one system supporting declarative consciousness.

NON-DECLARATIVE BRAIN SYSTEMS

As Endel Tulving highlights, to classify acts of memory systems as declarative or procedural, it is important to distinguish between thought and behavior. He suggests asking oneself whether one can "hold in mind the *product* of the act of memory" (Tulving 2000: 728). If the answer is "no", the act was "procedural". Thus "procedural memory" concerns all forms of non-verbal behavior and is one of the most important parts of the non-declarative memory system. Motor learning, as in sports, or learning how to play an instrument do not depend on the hippocampus, but on the brain's motor systems, including the basal ganglia and cerebellum. Such skills can scarcely be declared, if at all, which makes teaching motor skills so notoriously difficult: Ruminating about a motion sequence can hamper procedural memory and has ruined many-a-performance in concert halls and stadia! If thoughts are not necessary for these performances, and even interfere with them, artists, athletes, and drivers may express their consciousness through behavior. Similarly, when the young Helen Keller protected herself from the rain, she did not think about causal or intentional relations but was "procedurally conscious".

Another kind of non-declarative learning that influences behavior is mediated by emotions. Emotions are physiological processes of which we are unaware. They can eventually become conscious as feelings but, even if they do not, they can influence the human—and non-human—behavior. For example, it has been shown that a patient without a hippocampal formation on either side, who had been severely amnesic for 15 years following herpes simplex encephalitis and who could not learn any new faces or people since then, was still able to acquire preferences according to positive, neutral and negative affective valences that were attributed experimentally to three people (Tranel and Damasio 1993); the affective states that guided him were surely non-declarative. This is true of many physiological changes in response to external stimuli, which influence the brain as emotions and can—as somatic markers—help us in decision-making (Damasio 1994). Thus, emotions are not only non-declarative, but unconscious. Even when they become conscious as feelings, it may be difficult, perhaps impossible, to verbalize them so that some feelings are expressed as metaphor; ' butterflies in the stomach,' for example. Some epileptic seizures with preserved consciousness can elicit a feeling that cannot be verbalized because there is no word for it: No language can derive a word for a feeling that cannot be shared because only an individual person with epilepsy can experience it from a first-person-perspective.

One important benefit of emotional learning is that it can help protect us from potential dangers. To this end, the brain creates a long-lasting association between fear reactions and an object or event that has been experienced as threatening during an earlier encounter. This kind of learning happens automatically and unconsciously, but is very effective. In fact, this so-called fear conditioning is so effective that too much of it can contribute to post-traumatic stress disorders. Conditioning of negative (Le Doux 1996, Phelps et al. 1998) and positive emotions (Murray 2007) depends on the functional integrity of at least one amgygdala, an almond-shaped assembly of neurons situated within the medial parts of both temporal lobes just anterior to the head of the hippocampus. The amygdalae in both

hemispheres belong to the brain's limbic system, a constellation of evolutionary older brain structures that contribute to such diverse, but related, processes as production and perception of emotions and feelings, monitoring and control of motor behavior, detecting errors or granting rewards etc. One of the powerful methods with which the limbic system controls and guides behavior is making emotions accessible to the prefrontal association cortex as feelings so that we can talk about them and use them for decision-making. Nevertheless, we cannot "decide" to be angry, happy or sad. As Tulving says, we cannot hold in mind the *products* of limbic processes, which are therefore non-declarative.

Fear-conditioning is not the only way humans learn from emotions; someone able to speak a language can also warn and be warned. We usually remember events, people, and objects much better when our first encounter with them was emotionally arousing. In all these cases, the amygdala takes care of the arousal and thus enhances hippocampal activity, which can, in turn, result in lasting memory entries (LaBar et al. 1998). These are the declarative products of memory acts because we can hold them in mind as either images or words. Note, however, that the declarative memory contents we can recall are events, people and objects, not feelings. This dual role of emotions in both declarative and procedural memory may help resolve some misunderstandings in discussions of "emotional memory" in the performing arts.

DECLARATIVE AND NON-DECLARATIVE COMMUNICATION

If consciousness is a product of evolution that serves the survival and well-being of organisms moving freely in their environment, it would be surprising if no signs of consciousness—or other "kinds of minds" (Dennett 1996)—could be found in non-human animals or prelinguistic members of the human species. Nevertheless, it has been suggested that there may have been humans capable of verbal behavior but without the declarative, linguistic consciousness we know (Jaynes 1976). For now, we won't take this suggestion too literally. It will suffice to note that Jaynes discusses how two brain systems—here the two hemispheres—started to interact during the development of declarative consciousness. Recently, Solms and Panksepp (2012) described two other brain systems subserving different aspects of consciousness. They argued that, when discussing how human mental functioning is embodied, two brain representations of the body must be distinguished. First, there is a constellation of (multimodal sensory and motor) somatotopic maps, including the respective cortices and modality specific thalamic and cranial nerve structures that represent the external body and other external objects that provide conscious exteroceptive experiences. Because the perisylvian association cortex is part of this system, we can conclude that it is declarative. A second constellation of brain structures, including centers in and around the hypothalamus, brain stem, and emotion circuits that overlap with the limbic system, represents the internal body. These subcortical structures may generate "phenomenal affective feelings of their own" (Solms & Panksepp 2012: 155), and thus another kind of consciousness, not of objects but the subject of perception:

> ***We may picture this type of consciousness as the neurodynamic page upon which, or from which, exteroceptive experiences are written in higher brain regions.***
> *(Solms & Panksepp 2012: 156)*

Since animals have emotions that help them guide their behavior (Panksepp 1998), we must grant them some type of non-declarative minds mediated by this second, and more centrally

localized, constellation of brain structures. This system does not include any cortical centers that are relevant for human language and thus is non-declarative, though non-declarative does not necessarily mean non-communicative. In fact, social animals have a variety of means of communication, including alarm calls that not only signal danger but also whether a predator is approaching from earth or air etc. (see e.g. Hauser 1996). These vocal communications in animals are not mediated by the perisylvian cortical centers used for human language, but by brain areas that support emotional processing. For example, the anterior cingulate gyrus, an important component of the limbic system within the medial frontal lobe, participates decisively in the production of *innate* emotional vocal patterns. By contrast, the motor cortex and its feedback loops involving the basal ganglia and the cerebellum contribute to the production of *learned* vocal patterns (Jürgens, 2009). Data from presurgical evaluations of epilepsy patients indicate that both of these systems are still alive and well in human brains. While the motor cortex and perisylvian language centers produce speech, focal seizures within the amygdala can elicit crying, and seizures within the anterior cingulate gyrus can elicit screaming, swearing and laughing (without feelings of mirth). Although the expletives used in this involuntary swearing originate as words from language, ictal swearing is not propositional speech, but unconscious, overlearned and automatic motor behavior. Nevertheless, expletives result in immediate emotional effects in other humans, as do other emotional vocalizations like laughing, sobbing, groaning, crying, and screaming in humans and non-humans; effectively these act as emotional remote controls. These vocalizations are, however, not linguistic signs; perhaps not even their precursors. One important difference between linguistic signs and emotional vocalizations is their acquisition: While words can and must be learned, emotional vocalizations are innate behavior; even children born deaf and blind laugh and cry. With words and the appropriate syntax, it is possible to form an infinite number of sentences, while the repertoire of emotional vocalizations is finite, limited and not generative. Words can help keep in mind the *product* of working memory processes in forms of thoughts so that this product can be an *object* of thought processes again, while emotional vocalizations are behaviors intrinsically linked with the associated emotions. For humans and non-humans alike it is difficult—though not impossible—to control and suppress these emotional vocal behaviors. Whatever control is possible is mediated by a "medial cortical system" of vocalization control (Fitch, 2010), which is headed by the anterior cingulate gyrus (Jürgens 2009) and may represent the "voice" of the constellation of brain structures representing the internal body (Solms & Panksepp 2012) and perhaps the voice of "core consciousness" (Damasio, 1999).[1]

A new kind of voice control appears first in human primates with a vocal motor circuitry that Fitch calls "lateral cortical system" (Fitch, 2010, p 350), which perfectly meets the demands of the perisylvian language centers. The lateral cortical system and the perisylvian cortex of the dominant hemisphere may together represent the communication center of what Solms and Panksepp call the "external body," and of declarative consciousness. Even though we now have defined two independent communications systems of the human brain—a medial cortical non-declarative and a lateral cortical declarative system—it is unlikely that the first evolved into the second, and therefore it is unlikely that emotional calls evolved into human language for two reasons. First, both systems still function fairly independently in modern humans. Second, both motor prerequisites for speech and cognitive prerequisites of language require language evolution to be free of the innate bondages to specific emotions.

1 While Michael Chekhov would simply state: "In our art we don't have to have reasons. As soon as we have to have reasons, we can do nothing with them, and then it is not art. The actor must be able to cry without reason, simply because he is an actor. If he cannot cry immediately, then he must leave the stage. If he has to recall the death of his father, poor old man, etc., etc., then he is not an actor." (Chekhov 1985: 30)

CONSCIOUSNESS PERFORMED

When language evolved—whether Homo erectus or Neanderthals possessed a protolanguage, or whether language appeared only later in Homo sapiens—may still be a matter of debate. Because non-human primates, however, can use tools to some extent and early

pre-linguistic hominids made and used tools in a much more sophisticated way, we must assume that our last common ancestor—and certainly early hominids—had an extended (though not yet declarative) consciousness. Making and using tools cannot be inherited, so those who used them must have been able to teach and to learn. Without language, this can only have been demonstrated and imitated; an important reason for Donald (1991) to call the prelinguistic culture of Homo erectus "mimetic" and emphasize that pedagogy must have been important for mimetic cultures. Mimetic pedagogy seems an unproblematic method for teaching skills like making and using domestic tools. To teach hunting and fighting in this way, however, seems tricky because, without luck, teacher, pupil, or both, might not survive the lesson! Sooner or later *play acting* hunting and fighting will have become necessary. In other words, adults had to *pretend* conscious actions; they had to make their pupils imagine an animal to be hunted or an enemy to be fought, and in doing so they had to make sure the imagined hunter or enemy did not become too realistic and trigger automatic fight-or-flight reactions. Merlin Donald observes:

> *Much of the education of children in simple societies is still mimetic in nature. The basic vehicles of such training are reciprocal mimetic games and the imitation and rehearsal of skills. Children mime adults in every respect, including mannerisms, posture, and gesture, they learn the customs and scenarios associated with each principal arena of action, and they acquire the manufacturing and survival skills essential to the tribal way of life. In addition, children learn a series of subtle limitations on impulsive behavior in a variety of contexts. (Donald 1991: 176f.)*

If children had to learn to control their impulsive behavior in these teaching sessions, their teachers also had to control theirs. This suggests that early hominids could imagine and plan future events, and thus had command of a non-linguistic kind of reasoning that permitted what Karl Popper claimed for a critical scientific method, namely to let "our hypotheses die in our stead" (Popper as cited in Dennett, 1995). The need to control, and not trigger, their pupils' fight-or-flight reactions made it necessary for these early adult hominids to play act in such a way that it was possible for their children to recognize the teachers' *play* acting for what it was; i.e. the performance had to be recognizable as such. Or, as Rhonda Blair puts it: "Like a memory, the image is a thing unto itself, just as real as—but not the same—the object that triggered it". (McConachie/Hart 2006: 178)

We are not the first to suggest such a natural origin of the performing arts. For example, David Timson conjectures:

> *Acting, however, is as much a part of human nature as loving, or making war. Every day we act out to others the day's events. So perhaps in primitive times, before the development of language, theatre fulfilled a need. The need to communicate to the rest of the tribe where food could be found, for instance, and re-enact in dumb-show, the hunt. (Timson 2000)*

We think, however, that employing play-acting for pre-linguistic teaching purposes may have helped emancipate vocalizations from their immediate emotional effects. If actors and spectators—teachers and pupils—could reassure each other that they were engaged in play instead of a real hunt or fight, it was perhaps safe to "quote" a human—or non-human—emotional call. Perhaps play-acting paved the way for some of the first words of humans' protolanguage:

> *... if we ask how a species* already *possessed of imitative skills could come to acquire specific word meanings, innate cries could provide fodder for a different category of words from onomatopoeia, including words for emotions, for reactions to events, and for individuals (e.g. by imitating their laugh). Thus one can reject the idea that*

> ***innate calls form the seed of voluntary vocalization (...), while accepting that once imitation was present, such calls could form models for certain words, although they are not words themselves.*** *(Fitch 2000: 392f.)*

Thus play-acting could have contributed to the evolution of both a lexical and—through gesture—to a gestural protolanguage (e.g. Tomasello 2008).

Since declarative memory serves not only to preserve episodic memories but also to plan the future, and since language with its recursive syntactical structures provides the perfect means to relate thoughts, language evolution may also have accelerated the transition from object- and emotion-driven behavior to explicitly (and declaratively) planned actions. During the evolution of language as a social system, mnemonic and linguistic competencies may not always have developed in parallel, from which some of the Jaynesian discrepancies between linguistic behavior and declarative consciousness may have emanated. It is conceivable that individuals may have been able to verbalize a plan but not yet have been able to encode this plan reliably into their declarative memory. For acting, these individuals may still have had to rely on object- or emotion-driven motivations, and if declarative memories were not yet firm enough to motivate goal-oriented labor in all situations, it might have been helpful to rely on external memory markers like totems or pyramids.

EMOTIONS PERFORMED

During the transition from emotional calls to linguistic communication, the extended consciousness of hominids became increasingly declarative. However, while language evolution required the emancipation of vocalizations from their immediate emotional consequences, perhaps there were situations in which humans missed the direct power that their limbic vocalizations exerted over others. In spite of all its advantages, propositional language calls for argumentative minds and does not have the unhampered power of emotional remote control. That this process of emotional detachment has disadvantages may have become evident during teaching by play-acting. Then, as now, there probably was a pedagogic "arms race" between the teachers' need for their pupils' attention and the pupils' inclination to lose interest. For those who play-acted—the first representatives of the performing arts—it was perhaps sometimes necessary to again rely on emotions and intersperse the teaching act with occasional "real" alarm calls. The need for emotional arousal, or perhaps Jaynesian attempts to sidestep declarative argumentations and to tap directly into emotional inspirations for actions, may also have motivated the performance of rituals.

The necessity to elicit emotions was seen by rhetoricians over 2000 years ago. Their instruction manuals even classified emotions, the purposes for and the means by which they could be elicited according to the hierarchical system of the "decorum", in which not only gestures were designated higher or lower rankings between the poles of the "sublime" and the "low". The most sublime and important gesture and figure of speech, the aposiopesis, was to break off a sentence leaving it unfinished, accompanied by a spreading of both arms, which even threatened to let the toga slip down (Mühlmann 1996). The orator showed himself to be completely exposed, so overwhelmed by his feelings that he was unable to further verbalize his thoughts. This sublime gesture and figure of speech came not without peril for the orator; he ran the risk of making a fool of himself if either his emotional appeal to the audience was inappropriate to the subject of his speech, or if it did not work. The orator had to make sure that he succeeded in remote controlling his audience's emotions and, to this end, the rhetorical instruction manual taught that the orator must really experience the emotions he wanted to elicit in his audience. Verbal communication, with all its connotations and prosody, was not enough for this sublime purpose, it had to end and let the body talk (by means of the medial cortical, limbic system).

This rhetorical technique brings several methods of acting to mind, training to reach the unconscious by conscious means. Based on the teachings of Konstantin Stanislawski, further developed by Lee Strasberg, Michael Cekhov to name but three, a method was created that enables actors to recall emotions from their own biographies to identify with their roles, whether on stage or in a movie scene. Judging from neuropsychological memory theories, this must seem to be a contradiction. Recall is a method that retrieves an item stored in declarative memory, i.e. a *"product* of the act of memory" (Tulving 2000: 728). However, as we have shown, emotions are unconscious, and feelings non-declarative memory processes that cannot be recalled. But we also showed that conditioning can pair selected triggers with emotional responses. To find out whether top-class actresses and actors can really elicit their own feelings on demand, we performed a study using functional magnetic resonance imaging (fMRI), a technique used to show active areas within the brain. We asked participants to imagine ten different scenes of their repertoire (for 30 seconds each) with all the empathy and emotion they would use on stage. Then we compared their brain activity elicited by this task with the actors' brain activity when they rehearsed the text of the same scenes without being emotionally involved. We found that 6 out of 9 actresses and actors participating in this study activated the amygdalae in their temporal lobes and a ventromedial part of the frontal lobe that is also part of the limbic system. So, it seems that experts within the performing arts may be able to pair their feelings with characters or events on stage or on a set. (Whether "the method" is the only way to do this, or whether intensive examination of both oneself and the character to be impersonated can accomplish the same thing, is not within the scope of this chapter.)

When the Institute for the Performing Arts and Film and the Swiss Epilepsy Centre joined forces to study whether actresses and actors can recall not only emotional episodes, but the actual emotions, we had no idea that this study would take us on an emotional journey halfway around the world.

Many have experienced being deeply touched by actors and actresses while watching a play, but how can they convey such complex feelings? And do they really "love" or "hate" their partners while acting, or are they merely pretending?

Arts and sciences have a long tradition of quarreling over such questions like 'hot' or 'cold' acting, emotional identification or distant simulation. Using modern techniques of imaging brain activity, a joint research program *Authenticity of Emotion,*—from which the lecture-performance *Act Like You Mean It* evolved—has examined whether actors use emotions in their performances. Aided by Shakespeare's Romeo and Juliet balcony scene, we presented our findings as part scientific lecture, part performance. But how could we perform research results, especially when they come from such a complex subject as emotions? Emotions, however, are precisely what performers claim expertise in.

To summarize the *tour de horizon:* it was the local context and intimacy that allowed the spectators to identify with the actors and characters. What we initially considered a disadvantage—working with local performers for the home audience in their local language—became a real advantage; it drew the spectators into the dilemma between scenic attraction and scientific explanation. One conflict in the back and forward between theory and art resolved itself only at the end, when the play could be seen and felt as a piece in a closed course, when head and stomach would, momentarily, correspond perfectly.

Nevertheless, for those of us who are not successful, professional performers, it is not possible to recall emotions. We can recall emotionally relevant events, and thus most of us can understand what Trevor Nunn meant when he wrote in the lyrics of "Memory", a song from the musical Cats: "I remember the time I knew what happiness was". But recalling the associated emotion, i.e. "re-*feeling*" happiness (or sadness, anger, pain, or love) is difficult for most of us. This is probably one reason why early and modern declarative cultures have always cherished the arts. If not to artists, to whom else should we turn when we want to have feelings elicited deliberately? After all, they have been using emotional remote controls since the time of mimetic cultures. In contrast to rituals and rhetoric, however, the perform-

ing arts have had to use their emotional remote controls together with a declarative safety net, which protects us from immediate fight-or-flight reactions. Some declarative safety net would still appear to be indispensable, even for the modern performing arts. Without this, the audience might mistakenly perceive the villain on stage as authentic and flee, or even kill the actor, which allegedly happened to an actor who played Iago too convincingly (Epstein 1993). Rituals and rhetoric, in contrast, do not play-act and have no use for emotional safety nets. They deliberately use whatever emotional remote controls they can access.

The audience, then, wants the performing arts to create emotionally moving events. We should not forget, however, that, like novels, dramas are not least narratives in which plans of actions and conceptions of lives are dramatized alongside emotions. To convey the "full mental monty," the performing arts must address both our declarative and non-declarative consciousness. If our selves are the centers of gravity of our own narratives of consciousness, then other narratives show us other centers of gravity or, as Iris Murdoch put it: "The purpose of literature is to show that other people exist." If drama catches us both declaratively and emotionally, it might even let us witness alternative conceptions of *our* lives, which we may let die on stage in our stead.

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ARTIFICIAL INTELLIGENCE. TRADITIONAL EXPECTATIONS AND A NEW CATEGORY OF MACHINES[1]

MARTINA HEßLER

In his short book, "Mein Algorithmus und ich" (My Algorithm and I), the writer Daniel Kehlmann writes about his experiences with an algorithm named CTRL (Kehlmann 2021). He had received an invitation from a Cloud Computing Company to write a story together with the algorithm. Kehlmann enthusiastically accepted the invitation since he expected to get a glimpse into the future: If he—as a writer—was to become obsolete in the near future, he would be the first to know. Now, what did Kehlmann learn about the future?

Although the algorithm produced some impressive sentences Kehlmann concluded that it was not possible to jointly write a story with this algorithm. CTRL was unable to conceive of a plot, and it started to produce nonsense after a relatively short time. As Kehlmann writes: "… then the wheels jam, the transmission is blocked, then it's over, and you have to start a new story." (Ibid.: 48)

Two things are remarkable here. First, Kehlmann uses a classical machine metaphor to describe the failure of his experiment with AI: Wheels jam, the transmission is blocked. Second, during his narration he repeatedly comes back to one of his initial expectations, i.e., that CTRL could become a writing companion, a counterpart alongside whom human authors could create a story, the way they would be able alongside a human writer. However, Kehlmann's unexpressed prerequisite was that he expected to encounter a humanized technology as his counterpart.

1 A short version of this article was first published as follows: Künstliche Intelligenz: Eine neuartige Kategorie von Maschine oder die Vermenschlichung der Maschine / Artificial Intelligence: A New Category of Machine or the Humanisation of the Machine, in: Keskintepe, Woschech 2021.

This leads to the core question of this article, namely to what extent AI represents a new category of machines and if so, what kind of machine? The focus here is not only on the transformation of concepts of machine. Inseparably intertwined with that is the change in human-machine relationships and the change in human self-image.

HISTORICAL CONCEPTS OF MACHINES

The concept of the machine is currently experiencing a remarkable renaissance.[2] Within the context of digitisation and Artificial Intelligence, there is even talk of a "second machine age" (Brynjolfsson/McAfee 2014). But what is astonishing is how matter-of-course this has been. Why do we talk of AI as a machine at all? After all, AI does jar with traditional notions of machines. It represents a completely new category of machine. But what kind of "machine" is AI in the first place? In fact, is it even a "machine"?

In the early modern era, the mechanical machine became a metaphor for processes that were regular, regulated, and reproducible ("running like clockwork").[3] Furthermore, in the 19th century, the concept stood for smooth-running, rational processes. As Joseph Corn (2011: 29) stated: "Clocks spread the technical ideal of machines that run themselves with minimal control or intervention by a human operator." These notions shaped the image of the machine right through to the second half of the 20th century as something that was regular, uniform, always the same, reliable, dependable, and predictable. The mechanical machine performs according to comprehensible and clear rules.

And even if, until recently, computers and AI continued to correspond to this image of the programmed, rule-based machine (Heintz 1993), a new dimension to the machine concept had already been identified as early on as the 1950s, precisely at a time when computers were "evolving". In the 1960s, the philosopher Gotthard Günther (1963) spoke of the "transclassical machine", which represented a new category of machines. Such a machine no longer performed work, as the "classical Archimedean" machine did, but processed information (ibid.: 183). Similarly, Max Bense (1955: 7) emphasized that the "mathematical machines (…), occasionally also called thinking machines," represented a "new state of being of technology" (ibid.: 8). Regarding the "thinking machine", French cyberneticist Louis Couffignal (1955: 13) stated that machines were "of the most diverse kind", which is why machines had to be classified using different categories.

Thus, the advent of the computer in the 1950s made it necessary to identify and categorize these new types of machines.[4] Now, the talk turned to a new "state of being" of the machine. It put the spotlight on computers' ability to process information instead of them performing work. Further, it referred to the difference between mechanical and mathematical machines.

However, Heinz von Foerster (1993: 244-252), also inspired by cybernetics, added another thought beyond the rule-governed nature of machines. He developed the concept of a "non-trivial machine", which he distinguished from "trivial machines". The trivial machine resembles the mechanical machine by working in a rule-governed way, being comprehensible, and predictable. The non-trivial machine is a machine whose behaviour is not predictable and not understandable.[5] Thus, Heinz von Foerster anticipated — regardless of the various different technological foundations — characteristics which distinguish today's AI from other types of machines, as will be further explained in a moment. His concept of a non-trivial machine can therefore not be subsumed under the two categories of machines already mentioned, since it points ahead to present AI conceptually.

2 Recently, "the machine" or "technology" have been the subject of different monographs and articles. Cf. e.g. Burkhard 2018, who examines the void of a philosophical theory of machines, Schatzberg (2018), Technology. Critical History of a Concept, Chicago/London; Popplow (1998) who follows the history of machines in early modern time; or for a short overview cf.: Heßler 2020.

3 On the metaphor of the mechanical clock cf. Mayr 1986.

4 The thesis of three different categories of machines can only be sketched briefly here. A longer work is in preparation.

5 The distinction between the trivial machine and the non-trivial machine is not that simple, as von Foerster argues. However, it cannot be elaborated on that in the realm of this article. See also: Kaminski 2014.

THE NOVELTY OF AI

Given the latest trends in AI and its pervasiveness in everyday life, the history of the machine concept needs to be updated again.[6] A third category of machines has emerged: Machine learning represents a categorically different and novel form of machine.

Perhaps the current renaissance of the machine concept thrives on the hype that surrounds *machine learning*, which is the mainstay of present-day AI successes. The categorial novelty is featured in the name itself: adaptive and learning machines are what we are now dealing with.[7] They learn by using data; the algorithms are self-improving. Programmers have ceased programming how an algorithm ought to arrive at a solution; instead, they program algorithms capable of learning from their "experience" and then developing a model by themselves to apply to other data. They are, therefore, developing autonomously (Kersting, Lampert, Rothkopf 2019: 19).

From a historical perspective, this is not something entirely new. Neural networks were already being discussed in the 1940s and 1950s. Further, cybernetic machines were also "learning". Research into *machine learning* has been conducted since the 1980s (See overview Lenzen 2018). The fact that AI is now celebrating new successes is down to a new type of data volume, high processing speeds, and a new quality of efficient algorithms. It means that AI is no longer comparable to 20th century machines. But what exactly is so novel about it—beyond its essential "learning" aspect? The following will give a description of seven characteristics which are mutually dependent.

First, AI interacts in a new way with its users. Let's return to the opening example of writing a story jointly with AI, and this becomes very clear now. The mediating role of technology in the writing process has already been addressed many times. People have written with fountain pens, typewriters, or computers, which has influenced and altered the writing process in each case (See overview: Gaderer 2020). However, writing a story jointly with an algorithm, represents a completely new dimension—even if AI's possibilities are currently still limited, as Kehlmann aptly put it. Many other examples for human-algorithms cooperation could be added. AI has become an advisor, a partner, and an assistant in everyday life. AI can no longer be seen as a mere tool used to edit, create, or calculate something. Decisions are now made, discussed, or written in conjunction with AI, as part of a densely interwoven network of actions.

Here, and this is a second central key aspect, AI applications develop individually while interacting with its counterpart. AI is adaptive. Siri, Alexa, chatbots, social robots, and my previous example, the algorithm CTRL, learn the behavioural patterns, matters of interest and preferences of their counterparts and, over time, "advise" and "respond" more and more precisely, in keeping with those individual habits. Historically, this is a remarkable turning point. The machine-like aspect is no longer that which is standardised and ever constant. Instead, AI systems evolve differently. They have their own individual "biography", one that depends on their counterpart and the context in which they are used. It is the everyday behaviour, the everyday use by each individual that permanently modifies the AI.

Third, this in turn implies yet another characteristic that differentiates AI from machines in the traditional sense. The evolution of algorithms that learn autonomously cannot be predicted or planned, a feature of AI that resembles von Foerster's concept of a non-trivial machine. How AI will respond and interact with human beings in a year's time is anyone's guess. This means that machines also have a future all of their own.

Fourth, and connected with that, their results are not reproducible, another fundamentally new characteristic compared with the sort of machines we have been familiar with so far, which had no surprises in store; indeed, we could rely on their "sameness". However, talk to a bot today, for instance, and you quickly realise that the same question produces different answers.

6 Kaminski and Gelhard (2014) have published an edited volume in which the authors also put forward the thesis of a new category of machine. They coined the term "informal technicization" (informelle Technisierung) and focused on a new human-machine relationship in which technology becomes imperceptible because it cannot be directly experienced. The focus lies on ubiquitous computing.

7 Cybernetic machines were also learning and adaptive machines, but different ones. Cf. researches such as Cordeschi 2002; Pickering 2010; Müggenburg, 2018.

Fifth, another new dimension concerns machine decision-making. Admittedly, this is not something new. Decision-making machines have a long history. As early as the 1950s, philosopher and writer Günther Anders mocked the use of a computer to decide whether the US should end the Korean War. The computer, according to Anders, ultimately made a more ethical decision than humans did (Anders 1988: 59–64). Norbert Wiener (1958: 174–180) warned against "government machines" already in the 1950s. In the 1970s, the Allende government in Chile launched a cybernetic experiment in an effort to control the Chilean economy (Medina 2011). However, what is new is that AI, when it is applied in everyday life, must make *ad hoc* decisions. AI does not only support humans in decision-making processes. In part, it must make decisions itself—within seconds. This is what is currently being debated, e.g., when it comes to autonomous driving or the use of drones for military purposes. This raises the question of "moral machines." (Misselhorn 2018)

Sixth, and closely connected, what's also new is that machines are now capable of developing biases. Depending on the database used in each case, AI applications can, as is currently debated, perpetuate discrimination. Research into the history of technology has often shown that technology—by virtue of its cultural nature—is never neutral and that human assumptions have always been incorporated into its development. However, the fact that machines develop a bias in the course of their "actions" and then reach culturally formed decisions that are not transparent has a lasting impact on the very image of machines. In the 1950s and 1960s, it was hoped that computers would be able to make rational and objective decisions in an irrational world (Erickson 2013). Today, AI applications favour certain groups of people while discriminating against others.

Seventh, and finally, artificial neural nets are something of a black box for AI developers. The fact that technology is a black box is by no means historically new. During the 20th century, technology increasingly became a black box since most of its users no longer understand how it works. For example, while the first automobiles required their operators to possess a certain level of technical expertise, cars increasingly became a complex black box that even trained mechanics could only understand and repair with the help of diagnostic tools. Nowadays, most everyday technology is a black box for most users, be it the washing machine, the computer, or the mobile phone: a black box that can be easily operated or used, but whose functionality is not understood in everyday practice and, most importantly, also does not need to be known or understood. What is new, however, is that AI has also become a black box for the AI developers themselves. As Klaus Mainzer (2019: 254) put it, "From an engineering standpoint, authors therefore speak of a 'dark secret' at the heart of machine learning AI." He cites a 2017 article: "… even the engineers who designed (the machine learning based system) may struggle to isolate the reason for any single action." (Ibid.)

Since the early aughts of the millennium, the term "explainable AI" has emerged, and with it, a debate about the possible consequences of its incomprehensibility. In the meantime, developing explainable AI constitutes an important goal for computer scientists and societies. Within computer science as a discipline, however, this problem has been a topic of discussions for a long time. The term "black-box models" refers to this phenomenon, which goes hand in hand with probabilistic modelling and statistical learning methods, such as deep learning.[8] Thus, machines have a secret, as it were, in that their behaviour is not always "comprehensible". What's new is the incomprehensibility *in principle* that distinguishes AI as a black box from the many black boxes of consumer technology that we use so "naturally" without really understanding them.

Altogether, this gives rise to a breathtaking image of AI that radically breaks with previous notions of the machine: i.e., a machine that interacts with people, that "responds", that is adaptive, and develops in keeping with the counterpart in each case. Further, it is capable of developing bias. It is meant to make moral and ethical decisions; its behaviour changes; and it is not always reproducible and not always comprehensible, even for its developers. It becomes our advisor, companion and/or assistant. It is the interplay of all these characteristics mutually conditioning one another and rooted in machine learning that

8 https://gi.de/informatiklexikon/explainable-ai-ex-ai (02.02.2022)

makes current AI systems an entirely novel category of machine. In a nutshell, one could say that AI is becoming human-like. AI no longer corresponds to the 20th century image of the machine which humans often chose to distance themselves from. Rather, AI appears humanlike in that its behaviour is not predictable, that it is not necessarily reproducible, in that it may develop biases, and in that it has a past, so to speak: its behaviour is based on past data.

PARADOXICAL EXPECTATIONS: TRADITIONAL NOTIONS AND A NEW CATEGORY OF MACHINE.

During the 20th century, Western discourses on technology concerns focused on the fear that humans might become machine-like. Up until the 1970s, critical voices uttered dread that machines would lead to totalitarian rationalization, de-subjectification, and that uniformity of humans would ensue. People though insisted that they were different from machines. Behaving like a machine had clear negative connotations.

As argued above, AI no longer corresponds to this machine image of regular, mechanical, and always "perfect" machines. AI now simulates many features that have earlier been emphasized as typically human *in contrast* to the mechanical: individuality, subjectivity, emotionality, the unpredictability of human actions, the human capacity for ethical action. That means that AI challenges the human self-image, insofar as humans still define themselves in contrast to the machine.

Further, AI as an apparently "humanized" category of machine challenges human expectations towards machines. Humans tended to expect "high standards" from machines, e.g., a machine should be devoid of bad human characteristics, it should do "better" than humans. Early on, the pioneering AI researcher John McCarthy stated that nobody wanted a computer that loses its nerve (Cited in Lenzen 2018: 244). Or, to put it favourably, it should be a companion, just as Daniel Kehlmann imagined.

However, human expectations for AI as an "objective" advisor or a reliable companion point to a paradox: AI's described properties, which make it a new category of machine and apparently human, simultaneously mean that AI loses many of the properties of the classical machines, which humans have come to appreciate: the expectation of humans exerting dominance and control over machines, the assumptions of objectivity, reliability, predictability, and rationality. Exactly these qualities were attributed to the classical machine. However, these same properties cannot be ascribed to AI as a novel category of a machine.

Concepts of traditional human-machine relationships and traditional images of machines still shape expectations towards AI. That is particularly true for an anthropocentric attitude that sees humans as controllers, describes technology as assistance, emphasizes the hierarchy between humans and machines, and thinks in terms of dualisms. In a nutshell: Historically determined concepts of humans and machines shape our expectations of AI—although they are no longer suitable.

It seems that humans have not fully grasped yet the ambivalence and novelty of AI. They expect a categorically novel machine to behave in the same manner as the classical machine did. Daniel Kehlmann fell into the same trap when he commented on the failure of AI to write a story jointly with a human; his measuring stick was the concept of a classical machine against which AI failed miserably. It seems that people are not aware of this paradox: On the one hand, AI is supposed to become more human-like, and its new properties such as adaptability, learning ability, development ability, and individualization indeed

make it apparently more human-like. On the other, however, AI is supposed to be reliable, transparent, predictable, and objective. However, if AI becomes more human-like, it will also display more of what is regarded as human "failure" and unreliability.

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THE EYES HAVE IT. THE PROBLEM OF THE AVATAR GAZE[1]

ALEXANDER GERNER

1. NOTES ON THE FACIALITY MACHINE: ILLUSION OF VERGENCE OF GAZE AS THE ILLUSION OF LIFE?

The synthetic gaze that I call the "avatar gaze" is never boring. How could it be? It is not a true gaze at all but a synthetic media-simulated gaze. There is no gaze if you are rendered sleepless 24/7 (Crary 2014). There is no gaze if there is no rhythm of life and death, sleep and wakefulness, insomnia and awakening, interest and boredom, focus and distraction, selection and election, but an uncanny existence between life and death. There is no gaze if attention is not allowed to fall asleep and be woken up. There is no eternal gaze. A gaze comes to life, gets tired, gets bored, and ends.

A significant Disney study is related to robotics and the creation of immersive technology in which the simulated synthetic gaze plays an important role: the realistic interactive robot is artificially and mechanically programmed *as if having a gaze*. Hereby, the introduction of simulated saccades is meant for an illusion of vergence — the ability to focus on objects both near and far — to simulate the *gaze at you* instead of non-animated "empty" eyes looking "through you" rather than "at you" (Pan et al. 2020).

This also implies research on how to synthetically create the illusion of being looked at by the human counterpart through automatized animatronic a) *breathing movements*, b) *blinking*, c) *gaze following*, and d) *ocular movement*. All these micro-movements have to be

1 This research was financed by Portuguese national funds through FCT – Fundação para a Ciência e a Tecnologia, I.P., within the scope of the Transitional Standard – DL57/2016/CP CT[12343/2018], in the scientific field of History and Philosophy of Science and Technology, *Project: Hacking Humans. Dramaturgies and Technologies of Becoming Other.* Position: 2404.

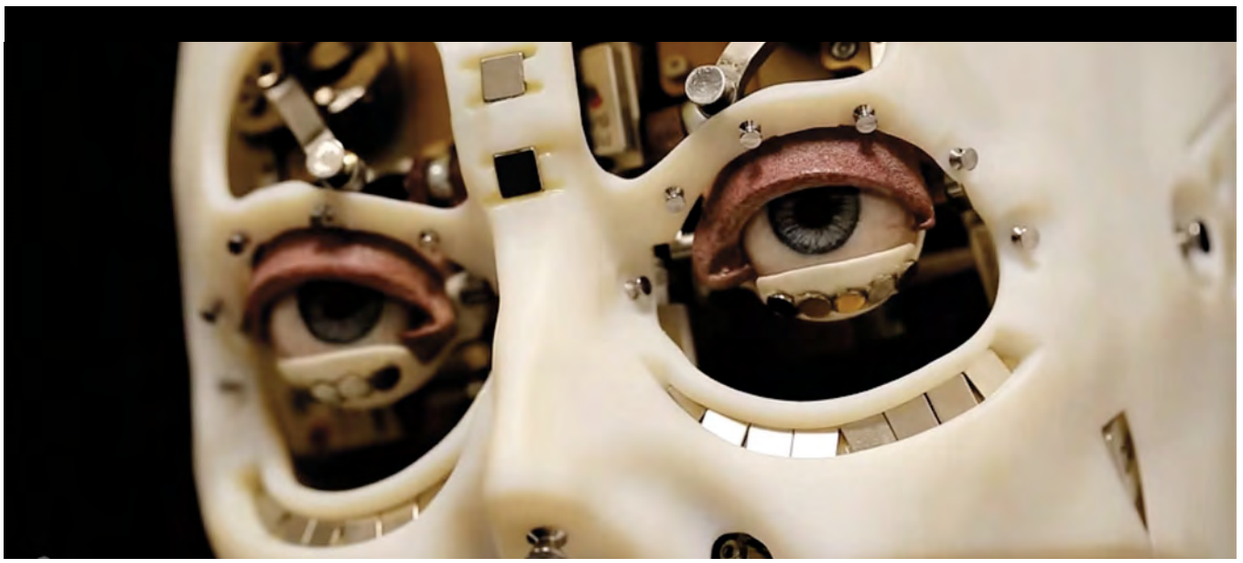

FIG. 1

SCREENSHOT FROM *DISNEYRESEARCHHUB* (OCTOBER 19, 2020). "REALISTIC AND INTERACTIVE ROBOT GAZE"

YOUTUBE VIDEO RETRIEVED FROM: HTTPS://WWW.YOUTUBE.COM/WATCH?V=D8_VMWWRJGE

mechanically reproduced, e.g., by quick motor-redirections, based on mathematical models and their technical implementation for creating the "illusion of life" through animism (Gygi 2018) and animation (Eisenstein 2010). Eisenstein understood the fascination and longing for animism as an *antithesis* to "soulless geometry and metaphysics" (Eisenstein 2010: 118). Do automata ever get bored or fall asleep?

Disney's research focuses on the analysis of automatic spectator boredom (Deng et al. 2017) and animatronic mimicking of gaze. Disney Research is also tackling the problem of gaze in mathematized digital animations. As each person has different characteristics of the eye—eyeball shape, interocular distance between the two eyes, rotation center (distinct from the geometric center of the eyeball), and specific visual axis (different from the optical axis)—this animation research concentrates on the eye motion characteristics of each individual that is reproduced as a believable digital character. The approach includes *eye tracking* and gaze estimation, capturing and modeling the eyes, and *eye rigging* estimation (Bérard et al. 2019), using 50 *eye poses* that reconstruct the overlapping averaged eye poses of limbus, eyelid interface, and visual axis—resulting in animation-ready eye motion characteristics of each animated face.

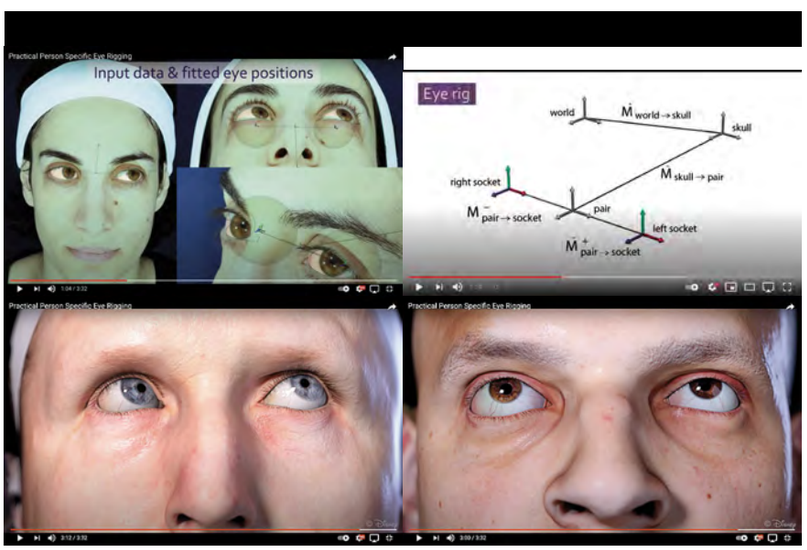

FIG. 2–5

SCREENSHOTS FROM DISNEYRESEARCHHUB (MAY 27, 2019). "PRACTICAL PERSON SPECIFIC EYE RIGGING"

RETRIEVED ONLINE: HTTPS://WWW.YOUTUBE.COM/WATCH?V=SQGOTUC8R5G.

Visual axis defines the gaze and is not identical with the *optical axis.* To neglect this difference results in cross-eyed gazes and uncanny valley effects due to inaccurate eye movement animations. Eye rigging for simulating eye motion characteristics for each Avatar includes taking into account the fact that the eye is not perfectly spherical and therefore does not exhibit rotation around all axes. This means for the accuracy of the eye estimation that a person-specific eyeball shape, rotation center, interocular distance, visual axis, and other rig parameters resulting in an animation-ready eye rig have to be considered:

> ***"a) The eye is controlled by six muscles (two per degree of freedom), which operate in a complex orchestrated way to rotate the eye. b) The gaze direction is not aligned with the optical axis of the eye (...) but corresponds to the visual axis (...), which is formed by the ray passing through the center of the pupil originating from the fovea at the back of the eye, which is the area where the retina has the highest sensitivity."*** *(Bérard et al. 2019: 442)*

2. WHAT IS IT THAT IS MISSING IN THE COMPUTER-ANIMATED FACIALITY MASK AND SYNTHETIC GAZE? CAN WE PUT IT BACK?

> ***"Let it be assumed that lines drawn directly from the eye pass through a space of great extent (...)"*** *Euclid, The Optics of Euclid (1945: 357)*

> ***"The radiating gaze /Euclid's tà optiká (300 BC) can be read as the ethical complement to his much better-known geometry. The book deals with rays emitted by the eye. These rays are something for which both words and sense have been lost."*** *Ivan Illich (1995: 52)*

The gaze is a phenomenon that awakens and falls asleep; it is based on the surprising and spontaneous *election* (Gerner 2011) of what grabs our attention in the world and cannot be reduced to a programmed, pre-selected set of possible entities. In the gaze, a visible difference exists in the comparative synchronization of the same and the other.

As the avatar moves forward and acts *as if* a human with faciality, it must be critically scrutinized as it transposes our imaginative openness of gaze towards the other into prosthetic concrete movement—and that the gaze of the one meets the gaze of the other. This encounter of regarding in a vis-à-vis means, for Plessner, reciprocity between me and the other in which we can switch to the position of the other and become an other for each other:

> ***(...) the gaze that meets the gaze of the other. In it we have the elementary phenomenon of reciprocity between me and the other. As soon as my gaze meets the other's eye, I see myself looked at, gazed at – and not only (in the manner of the ophthalmologist) the eye is examined. The other not only has a look, but gazes at me and thus stands in the position of the vis-à-vis, as the one with whom I can exchange positions. In this interchangeability of the point of view, which his gaze testifies to me, he is an Other, I am an Other for him.*** *(Plessner 2016: 384; translation mine)*

2.1 THIS GAZE DOES NOT EXIST: ON THE MISSING GRAVITAS OF ATTENTION IN THE AVATAR GAZE

Ethical, aesthetic, and social difficulties derive from normative issues in computer-assisted and modeled *ghosting* of already deceased famous actors in cinema, such as *ghost acting* (Winick 2018). In this case, face tracking, face matching, and face transfer use computer generation to display the face of a dead actor through a mask as a digital over-coding onto the face of another actor for the digital reenactment of expression, mouth, gaze, pose, or even the whole body. The techniques of deep neural networks using deep fake technology create believable media (Mirsky & Lee 2021) that are applied in digitally altered film acting. Another example is *de-aging*. In this technique, an actor works with a self-mask wearing his or her younger digital face-mask (where the problem of *young face-older body dissonance* is easily noted as uncanny—as was the case for the character played by the actor Robert DeNiro in Scorcese's *The Irishman* (2019). Scorcese, according to the *Guardian* newspaper, commented that there was a problem with the expressiveness of his actors' eyes, adding: "Does [the technique] change the eyes at all? If that's the case, what was in the eyes that I liked? Was it intensity? Was it gravitas? Was it threat? And then how do we get it back? I don't know." (Scorsese, cit. in Salmon 2019)

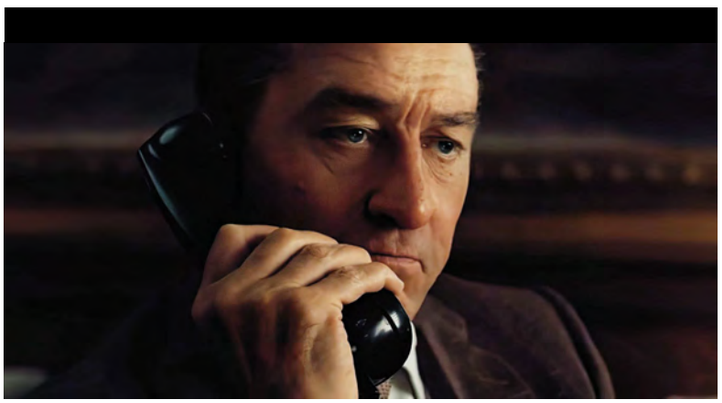

FIG. 6
DE-AGED CGI SELF-AVATAR FACE OF THE ACTOR ROBERT DE NIRO IN *THE IRISHMAN*.
SCHAEFER, S. (SEPTEMBER 2, 2019) "THE IRISHMAN: DE NIRO RECREATED GOODFELLAS SCENE TO TEST DE-AGING CGI," SCREENRANT. HTTPS://SCREENRANT.COM/IRISHMAN-ROBERT-DE-NIRO-GOODFELLAS-DE-AGING-TEST/

As in the case of paintings where an animal's eyes seem to follow us, gazing back on us and stimulating our imagination, we experience the fact that the animal gaze has *gravitas*. In that case, we believe that the animal other's gaze is responsive, weighed by temporality and mortality, and possibly sparking an interest between estrangement and trusted familiarity, gravitating around awareness, curiosity, seriousness, uncontrollable and unexpected danger, that may surprise us. The sense of face, if the gaze is well captured, provides a sense of rendering the possible other's presence real and visible—inside an anthropological-evolutionary advantage of enhanced human visibility (as a hunter), but as well with an increased risk of counter-violence in becoming visible to the gaze of the other, e.g., as prey.

FIG. 7
ABRAMOVICH'S PERFORMANCE OF THE GAZE, CONSISTING OF NEARLY 750 HOURS OF SITTING OPPOSITE OVER 1500 MUSEUM VISITORS, OF WHOM PORTRAITS WERE TAKEN: "THE ARTIST IS PRESENT" MOMA, NEW YORK, 2010.

A gaze responds differently in each new scene. The gaze of the other is alterity in action. In the gaze of the other, mere visual-spatial, directional, and textural data as noise becomes social co-resonance with the other. It shows our face to the other and holds the other in our regard, but "with the other's eyes" (Plessner 2017). A stranger can reciprocate a gaze

that becomes an exchange: currency of the social and cultural necessities of perception open up a spontaneous field of modes of possible encounters — sociality is possible. The modality and cultural-historic regimes of gaze prompt responding modes of action. Thus, the gaze endows us with the other's attention, forcing us to *act accordingly*. In so doing, we hold each other responsible in one another's gaze.

A gaze without gravitas would be emptied from the possibility of *pairing the gaze with the other* where almost nothing happens — but this "almost nothing" is the gaze that happens face-to-face with the other, hooked on the necessary imagination and mimesis, as the other looks at you. An example of an art of pure gaze would be the Abramovich performance: "The artist is present" that is strictly about pure gaze and the openness of what it possibly could trigger as a response (see fig. 7).

A solipsistic, sleepless, endless *parallel avatar gaze* that fails to create a face-to-face situation, a shameless or riskless gaze: this is a *synthetic* faciality mask that has no face to lose (see fig. 8). A mathematized surface of synthetic faciality looks through you — "withdrawn" into endless infinity. The avatar gaze would be an extinguished gaze from and towards nowhere — one that does not *look at* you but redirects you to the same: the avatar holds a *gaze from nowhere*.

FIG. 8
THIS GAZE DOES NOT EXIST: SYNTHETIC IMAGE WITH AVATAR GAZE CREATED BY "GANISM" – A GENERATIVE ADVERSARIAL NETWORK STYLE GAN2 SMILING FACIALITY RECONSTRUCTION CF. WANG 2019; KARRAS ET AL. 2019
RETRIEVED FROM HTTPS://THISPERSONDOESNOTEXIST.COM, SEPTEMBER 6, 2021, CREATED AT THE TIME OF 15:54 P.M.

As there are no dreams that the avatar gaze dreams up, we want to look more closely at Scorsese's statement and the complexity of what he designates as a faulty deal: he wanted a younger actor's face and got a CGI face with an attentional engine that does not show the temporal experience of its actor, but rather an animated and mathematically constructed faciality mask that exists outside of time.

FIG. 9
SCREENSHOT OF THE MOVIE *SONIC – THE HEDGEHOG* SHOWS TWO VERSIONS OF THE TRAILER – ABOVE WITH UNCANNY EYES BEFORE THE CRITICISM AND BELOW AFTER THEY WERE CHANGED. SEE: KINOCHECK.COM (2019)
HTTPS://WWW.YOUTUBE.COM/WATCH?V=FM2SVYAQYFU

2.2 THE EYES HAVE IT?

Even animated faces and their eyes become issues in the dispute over their acceptability and their uncanniness. A case was made by fans against the designed (and behavioral) human-like hyperrealism of eyes and the *imitation game of human-likeness* in CGI with the cinematic adaptation of the Sega videogame Sonic in the film *Sonic — The Hedgehog* (2019). In two different versions of test trailers, fans were upset about the appearance — too close to human eyes — of the character and in a subsequently accepted criticism the director Jeff Fowler (@faultown) announced on Twitter on June 2, 2019 in a message that received 175,000 hits: "Thank you for the support. And the criticism. The message is loud and clear… you aren't happy with the design & you want changes. It's going to happen. Everyone at Paramount and Sega are fully committed to making this character the BEST he can be…" #sonicmovie #gottafixfast.

If Robert de Niro lends his face to a de-aging CGI treatment, we might want to call his younger digital face a faciality avatar. Algorithmic rationalities (cf. Mersch 2021), including mathematical modeling in the culture of AI, expand machine learning and artificial neural networks that work with statistics and algorithms into (yet) non-mathematical realms, creating among others programmed

sociality (Gerner 2020; Bucher 2018), while at the same time aiming at artificial creativity. Algorithmic rationality in digital faciality, despite producing "similar" faces and deep fake facialities of persons who do not exist, is limited by what cannot be decided by a program. In this sense the website "This person does not exist" wants to alert us to the existence of non-human human-like images created by AI algorithms, but are these algorithmic facialities able of a human gaze? Might we confuse an animated image with a gaze of another living creature?

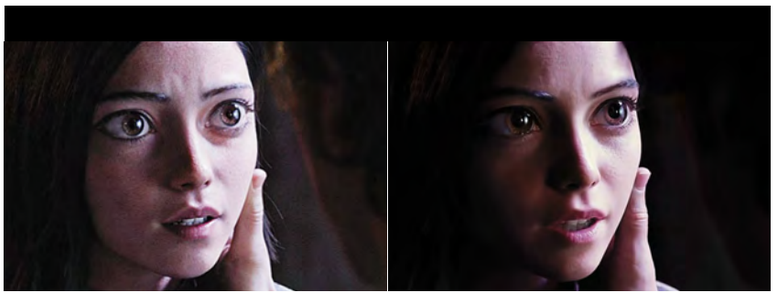

FIG. 10
FIXING THE UNCANNY EYES OF THE CGI CHARACTER IN THE FILM *ALINA: BATTLE ANGEL* BEFORE (FIG. 10, LEFT) (TWENTY CENTURY STUDIO SINGAPOR 2017, FIRST TRAILER) AND AFTER (FIG. 10, RIGHT) IN THE FINAL MOVIE VERSION 2018 WITH ENLARGED PUPILS AND EYEBALLS THAT ARE CONSTRUCTED TOPOLOGICALLY AS EYE-*SPHERES*. DO LARGER EYES RENDER COMPUTER-GENERATED EYES MORE "REALISTIC", MORE ACCEPTABLE AND LESS UNCANNY IN THEIR DIFFERENCE TO HUMAN EYES?

Such an algorithmic image could be called an *image singularity,* as it merely comes into existence when the site is clicked upon; in the next click the algorithmic data is reorganized to become yet another different automated image-output — to create another "person" that does not exist.

The attribution of non-existence lies in the eyes of the spectator who, by his or her technological involvement in the visualization algorithms, actually co-triggers the image that does not refer to any real-life person whose gaze one could meet. However, the biggest problem of social interaction in sharing attention — sometimes called "the eyes have it" (Emory 2000) — remains unresolved by AI. Facebook is currently attempting to tackle this problem with the high-fidelity Codec Avatars that simulate *social presence,* considering faces and using coordinated audio- and gaze-driven animations for photo-realistic real-time relighting of animatable face avatars (Sai et al. 2021). Facebook's integrated facial, eye, and speech AI algorithm remains in the realm of the simulation and animation of facial landmarks and facial maps. Physiologically, the white sclera prepares humans (Kobayashi/Koshima 2001) for social attention, known as "joint attention" in social psychology, anthropology and philosophy. Still, the mutual gaze is different from the physiological reality of the eyes as part of a sense of face. The social "other" in this situation of joint attention — a key feature of human social cognition — in a mutual gaze encounter triggers a categorically different social function than the mere physiological biology of visibility of an object provided by the visual organ of the eyes. Joint attention implies cognitive, behavioral, and phenomenological aspects including common, mutual and shared attention (Siposova & Carpenter 2019), involving knowledge, goals, and shared affectivity. Can these sensible and fragile situations of joint attention be simulated by an AI model that includes an avatar with a simulated gaze?

If we delve into the question that the filmmaker Martin Scorsese is asking — what precisely it is that we relate to if we look at the eyes of the other, such as the intensity or even "gravitas" of an actor's gaze — we should look at the interesting empirical research on the issue of the extramissionist attribution of attention to the other as a fundamental problem of the social in social perception of gaze and visual joint attention.

2.3 CAN AVATARS SIMULATE THE EXTRAMISSIONIST ATTENTION BELIEF THAT THE EYES PROJECT LOOKS OR EMIT RAYS OF LIGHT?

Can we think of a folk psychological model we use permanently in a social co-attention and joint attention situation in which the "eyes have it" (Emery 2000)? This hinges on a socially strong condition of attention capture and attention maintenance with the proximity

of the other. A possible, but unorthodox explanation of "the eyes have it" could be an until now unknown fundamental physical force embedded in the eye-gaze — in parallel with the cosmological physics debate on the possible existence of an until now unexplained dark matter of quintessential force that would theoretically push the universe faster apart than contemporary physical explanations. Could it be possible that there exists a special force by which our eyes, through their gaze, emit light on objects in space?

Recently, Arvid Guterstam et al. (2019) showed that despite explicit knowledge of the test-persons that the eyes neither emit light nor any kind of force-carrying beam in an extramissionist sense of attention, we are nevertheless subconsciously prone to the claims of these metaphysical-metaphoric models. Humans believe even subconsciously in the force-emitting capacity of the other's gaze. We endow the other's gaze with a power over objects in a commonly perceived world. This nonsensical notion of an attentional emitting gaze able to affect objects at a distance nevertheless has to be read within "the view that the sense of agency relies on causal inferences between actions and effects" (Recht/Grynszpan 2019: 7). Although this specific extramissionist attention beam does not exist, its imaginary-experiential strength reflects how we construct counterfactual — on the physical and physiological level — metaphorical everyday experiential and intentional folk beliefs regarding the social power of proximity and our perception of the gaze of the other, resting not upon a foundation of a third-person physical fact, but on metaphorical experiential-psychological first-person evidence (in our case on the social importance of the gaze and shared attention for our social behavior). As Edward B. Titchener already noted at the end of the 19th century, such beliefs are "based on a misinterpretation of fact" (Titchener 1889: 895) in which *we become susceptible to the attribution of the other actor's attention* with the interpretation and belief of a force-imposing amplification of the other's gaze. This means that the constitutive look of the other that constitutes me as a person, the foundational act of becoming an intentional object in the gaze of the other, is related to the sensory imagination of a metaphoric beam or spotlight based on the mere reality of visibility through light.

This imagination of the emission of light through the eyes is a *false* popular belief that may create in the observer an "uncanny feeling" inscribed in a cultural history of invisibility *still to be written,* as the idea of extramissionist eyes emitting light is contrary to the function of the eyes as part of seeing, linked to the visual nerve and the different brain circuits involved primarily in *receiving* and *not emitting* light to form the images seen.

If we think in terms of the experiential field approach of Kurt Lewin, we have to heed the transformation of a peaceful landscape into a battlefield (Lewin 1917: 447) and vice versa. This phenomenological switch indicates how peaceful zones may quickly turn into combat zones of social-psychological danger that suddenly turn from an idle or aesthetic appreciation of open landscape into a hunter's gaze.

What is crucial in Kurt Lewin's trailblazing description of the field psychology of the war landscape, published in 1917, is the clear-cut distinction between two different kinds of landscapes: on the one hand, the *mathematical-topological* and *vector-concept of space* that is *open* — principally in all directions/vectors and equally — *to infinity,* and now, on the other hand, the "directed landscape" (gerichtete Landschaft) that replaces it. This "directed landscape" is an intentionally and experientially structured landscape or lived and limited space that has to be heeded as a *socially experiential lived place* and contains not light beams, but calculated vectors of the other's active and open attentional gaze, which we never catch (Finkielkraut 1997: 12–13). Catia Pesquita and colleagues found that "humans are sensitive to subtle differences in bodily cues that occur when someone else's attention is controlled by an internal choice vs. an external signal" (Pesquita et al. 2016: 1).

The activity and empathetic relation to mathematized actions I call externally "programmed action." Programmed action is a forced transposition of intentionality: a "programmed other." This programmed other — paradoxically — suspends the characteristics of alterity. We might observe such a characteristic alterity suspension in the application of DeNiro's de-aged mathematized facial mask in *The Irishman.* Scorsese calls it a loss of

gravitas. As a result of this, the CGI faciality mask becomes non-endogenic, steered by the exogenic control of the programmer. A disjunction between acting and mapped faciality is the result. The face of the actor loses the direction, force, and gravity from the directed facial landscape open to the gaze of the other, as an artificial gravity is attributed to the face from the outside. The actor cannot change his or her faciality appearance depending on the situation and the gaze of the other. The actor can now only shine with a mathematically polished face: spontaneous inner choices and the upcoming event of different and possible contradictory and in-between modes of the gaze are gone.

This is important when reflecting on the problematic gaze of CGI images and avatar action and on why the juvenile CGI mask on the body of an older man becomes uncanny. An actor's body is combined with a head with CGI faciality; a gaze is mapped with eye-dynamics as a computational topological map; an active body lacks endogenic control of its eyes' gaze; and the eyes lose their intensity of wanting, willing, and choosing to look, which is in line with the findings of Pesquita et al. (2016) on social sensitivity to internal choice vs. external or "programmed" action.

This situation of the attentive social power of an emitted force is specifically true for fine-tuned or micro-actions of the eyes, the gaze, and other facial moving parts, including lips and tongue, that probably make up a part of our capacity to feel empathy towards the other while observing his or her gaze and movements. We infer expressions of affects or emotions and add significance (Guterstam et al. 2019: 238) to them; or as Levinas's responsive philosophy of the other puts it: "The eyes break through the mask—the language of the eyes, impossible to dissemble. The eye does not shine; it speaks" (Lévinas 1976: 66).

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WHAT IS *KOINŌNIA* UNDER TECHNOLOGICAL CONDITIONS?

DIETER MERSCH

Over the past fifty years, the core of the sociality of the social has culminated in discussions within the social sciences in the reconstruction of what Aristotle (1999: 1252a) called κοινωνία, or more exactly κοινωνία πολιτική. Koinōnia politikē determined the concept of politics in Antiquity. However, it should be remembered that πόλις, the polis as an organized polity, served first and foremost the formation of community, so that the political and the social came together. Yet the literal meaning of the Greek word κοινωνία is the association, κοινός the public, or κοινωνέω to share or to participate so that the expression addresses what is common to the community, what holds it together, as Plato (1976: 449a-466d) wrote in *Politeia*. In particular it refers to political organization, which in Aristotle's concept comes before social bonding by creating the prerequisite legal order.[1] Πολις and κοινωνία were thus synonymous for Aristotle and his successors, for in Antiquity it went without saying that bonds between human beings could not be permanent without law. Somewhat later, during the rise of Christianity, the concept underwent a religious turn, so that κοινωνία referred to "participation" in the kingdom of God, in God's creation or in the divine state, creating the true *religio,* the bond between the divine and the human, or between transcendence and immanence. For that reason, κοινωνία plays a key role in the New Testament and in the dogma of the Church fathers. The law in this case was not always made by humans but was part of the presentation of the divine revelation of the tablets to Moses.

These delineations have all been lost in modern sociology and social sciences. κοινωνία, chronically questionable in modern societies, must therefore first be newly defined, whether within a classical social contract or by means of power and violence, which however has failed to prove its legitimacy. It is striking that all social designs since the catastrophe of the Second World War and the totalitarianisms of the twentieth century, have explicitly revisited the question of κοινωνία in order to give it new foundations. Among the most noted attempts to respond to this question in political philosophy are, aside from communitarianism, Jean-Luc Nancy's concept of "being-in-common," Niklas Luhman's "social systems," Jürgen Habermas' theory of "communicative action" *(Verständigungsverhältnisse)* and Bruno Latour's Action Network Theory. The latter three in particular shall be discussed in the following as exemplary examinations of the problem of κοινωνία under specific technological conditions.

1 Arendt (1958: 32) would however claim the opposite, that "man is a 'social' before he is a 'political animal".

Luhmann (1973: Chap 2, 4) interprets κοινωνία systematically, that is, as embedded in the functions of social differentiation and their stabilization. With this there is a shift in the canonical concept of κοινωνία, which is redefined in an analysis of the mechanisms that make differentiation possible. Sociality and community are not simply givens but must be created or produced through functions that ensure the reproduction and preservation of constitutive systems of difference in the social. To these belong in particular trust and communication, as well as media as a generally formative power, whereby it is not up to the individual functions whether community is formed, but up to the functioning of the systems themselves (Luhmann 2021, 2017). Against this, Jean-Luc Nancy picked up Martin Heidegger's figure of "being-with" (1962: § 25–27) and wove it into his ideas about "being-in-common" with the emphasis both on the shared experience and participation as well as on the "with," that is to say allowing for both on the *cum* and the *com* of *communio*. κοινωνία is thus grounded in a possibility of participative cooperation, which Nancy understands as *desœuvrement,* an "unworking" or "inoperability" that cannot be created but is always still to come (Nancy 2010, 1990, 2000, 2016). Yet *désœuvré* means less "unworking" than "not-working" in the meaning of interrupting a "work" or renouncing production, or also turning away from every kind of working and towards that final practicality of society and community. In that case, for Nancy, *desœuvrement* refers to the element of becoming within κοινωνία, which simultaneously retains its own difference or distantiality *(Abständigkeit).* Put another way, the possible commonality of human beings is always yet to come. It is unfinished and torn asunder by a fundamental rift *(Riss),* so that it is not the work of a working process or production, but must first be formed with all of the connotations of forms and forming, also including the refusal of the form or its unrealizability.

It remains a constant question what then participation might mean, how it can be produced and whether it is enough for an adequate κοινωνία. Participation in the most radical sense of everyone taking part was for example one of the fundamental tenets of alternative movements in California in the early 1970s. In their determination to avoid any usurpation by "the system," they organized themselves in new "communes" and other forms of living together.[2] What that might look like again brought up the question of κοινωνία, which they however sought to solve within the framework of a social cybernetics that did not use political or social or religious arguments, but solely technological ones. It was above all the utopia of computerization as a universal tool of connection that should realize the reorganization of sociality through the virtual networking of a global public information system.[3]

In a remarkable essay still topical today, Jürgen Habermas, at almost the same time, rejected this technical solution and castigated social cybernetics as a protofascist form of "social technology" that sought to control everything.[4] As an alternative, he propagated the linguistic turn that reinterpreted κοινωνία within the practice of communication. Habermas's philosophy of understanding *(Verständigung)*—a "theory of communicative action" that can in fact be read as a "critique of communicative reason"—is not a design for a utopia, but a concept of communicative Enlightenment on the basis of a social discourse in which everyone participates (Habermas 1984, 1990). Habermas (1979) underlines two aspects of this model: first, the theory of the dual propositional and performative structure of speech, which sees language as having both a representative as well as a relational or binding function. Through this "illocutionary force," sociality is constituted as a simultaneity of meaning and practice through presuppositions such as comprehensibility, truth, truthfulness, and rules. Second, the process of coming to an understanding is for Habermas intrinsically linked to an ideal but contrafactual rationalization. This holds the "unforced force of the better argument" against the violence and terror of forced obedience (Habermas 2001: 94).

Habermas propagates κοινωνία in the sense of a permanent process of enlightenment generated by dialogue that brings members of a society together through reason. In this way the sociality of society follows the "regulative idea" of a process of understanding that is both continuous and consensual. This model undoubtably contains its own form of one-sidedness. One the one hand, it is questionable whether κοινωνία is rationally expli-

2 A good overview of the debates of the time is collected in the catalog edited by Diederichsen Franke (2013).

3 This was also the birthplace of the conservative communitarian movement that brought attention to the blind spot of liberal societies, namely a lack of solidarity and neighborliness that cannot be guaraneed through individual freedom.

4 See on this in particular the Habermas/Luhmann debate in their book *Theorie der Gesellschaft oder Sozialtechnologie* (1971), esp. Habermas's contribution on p. 142–290.

cable at all and must not instead always be thought of as κοινωνία πολιτική which has the political and not the rational as its starting point. Furthermore, in Habermas' model, its binding force is limited to the pragmatics of language and communication. But not only are these subject to multiple biases, the model all but ignores the many other social practices such as art, gift giving, rituals, or also witness, law, and trust, not to mention the libidinous human connections which should not be underestimated in the creation of bonds. Furthermore, the sole alternative between reason and violence as construed by Habermas does not exist, because there are situations in which consensual discourse cannot help but itself communicate violence. Clearly, κοινωνία must be understood as a dilemma, for law can not be enforced by consensus alone just as conversely there can be no legitimacy without social consensus.

Nevertheless, Habermas offers a decided counter-program to the counter-culture computer network program model, which aims to regulate the public sphere solely through unlimited access and the κοινωνία by providing an open infrastructure, as if the commons alone would make community possible. Since the 2000s at the latest, this former utopia has flipped to reveal the opposite of these hopes: a monopolistic power structure of social media that are helpless in the face of the proliferation of hate speech, disinformation, and the destabilization of democratic structures.[5] Only the naiveté of techno-euphoric subcultures and their stubborn visions of transparency, freedom, and equality could believe that fast internet connections, good will, and wide-scale participation would be enough to allow the quasi natural development of a globally connected community of knowledge counter to the hegemonic political orders. Technical networks are in fact diagrammatic structures ruled by formal relations not suited to the growth of κοινωνία, so that the realization of "happiness" through technology alone remains a fatal misconception.

Bruno Latour (1993) introduced a new meaning for the general metaphor of networks, which he placed under the aegis of a "symmetrical anthropology" that understands sociality not as "humanist" but as an intrinsic connection between "human" and "non-human entities." In his book *Reassembling the Social,* he also refers back to the κοινωνία of Antiquity, but expands formal participation to include the heterogeneous engagement of both humans and other creatures or things, artefacts, signs, goods, technological devices and media, etc. (Latour 2005: 5ff.). In Latour, "networks" have nothing to do with computer networks but act as an abstract concept of shared agency. Despite all varying readings and vulgarizations of actor-network-theory, the term "actor-network" is therefore *one* word, in which actors are not those who act or interact with one another, but a description of diverse kinds of agency that stem from different modes of relational connections, multiplicities of very different elements. Here that which Latour previously, in his analyses of scientific research, referred to as "nets" of disparate hybrids, become "associations" that are as loose as they are open, mixed coalitions that do not allow discrimination among the elements or types within them (ibid.).

Decisive here is the expansion of the idea of the social to include the simultaneous participation of the non-human and the non-social, for, as Latour wrote together with Michel Callon, "There is no thinkable social life without the participation—in all the meanings of the word—of nonhumans, and especially machines and artifacts." (Callon, Latour 1992: 359) Similarly, he wrote in *Reassembling the Social:* "We are no longer sure about what 'we' means." (Latour 2005: 6) Instead, we are dealing with heterological processes of bonding, intertwining, and connecting, but also of separating and a paradoxical entanglement made of links that do not in themselves even need to be social. Hence Latour localizes κοινωνία in a radical relationalism in which, as Erich Schüttpelz has aptly shown, relations are primordial in contrast to the relata to the extent that the former first gives the latter their weight and their position. It thus follows that κοινωνία can coexist with very diverse "modes of existence," for which reason Latour proposes replacing the in his view problematic term "social" with the term "collective." (Latour 2013) Collectives can mean a variety of things without immediately privileging human "associations" or social classes.

5 In a remarkable move, Facebook founder Mark Zuckerberg, defending free speech in front of the American Senate, insisted that he only provided an infrastructure. This is extraordinarily naive, for infrastructures are never neutral, but themselves play a role in shaping the type of expression possible.

The reason for this critical maneuver is obvious: on the one hand, Latour is attempting to dodge the seeming foundational paradoxes of sociology and the social sciences — that sociality in the sense of κοινωνία must always be presupposed to determine the social. It thus proves in advance to be an idealization of what is to come the reality of which is chronically questionable. This is true of the concept of "cooperation" as well as of "social relationships" or "communication," all of which presuppose that which they are seeking to explain, for example when the concept of communication assumes a delineation of a predetermined "community of understanding" of speakers and listeners *(Verständigungsgemeinschaft)* and their mutual recognition through the practice of speaking.[6] Just as conjuring the term "sociality" gives no reason for the fact of its existence, the term "communication" does not tell us *why* we speak to one another or what moves the speaker/listener to listen one to the other. This is incidentally also the crux of theories of the social contract, to the extent that every contract demands rules of negotiation and decision that in turn must be based on that which the contract is supposed to regulate. We are thus dealing with a *petitio principii* that however puts logic before κοινωνία, because it does not recognize the specific transcendentality of the social and thus the precedence of κοινωνία. Rather, people are always dependent on sociality, without which they would not be "human." Therefore the foundation of the social cannot be discovered, at its bottom is always another social. The social cannot be avoided, but the more important question is whether the concept of "networks" is sufficient to describe it.

Rather than founding a "sociology," Latour only formulates an "ecology of collectives" about which it remains unclear whether it is already a social science, of which the glossary states under the term "Association":

> ***Extends and modifies the meanings of the words "social" and "society," words that are always prisoners of the division between the world of objects and that of subjects; instead of making the distinction between subjects and objects, we shall speak of associations between humans and nonhumans; the term thus includes both the old natural sciences and the old social sciences.*** *(Latour 2004: 237–238).*

Latour's approach is mostly about expanding the definition of the social to include elements and processes that are alterities, which he claims are also constitutive for sociality. In this way he hopes to resolve the confusion caused by the dichotomies of traditional social science terminology and dismantle their vertical hierarchies. This adds a new perspective to the characterization of social orders, for sociality for Latour is not primarily about the vitality of social relationships. More importantly, human societies create structures that are not founded solely on interaction and coexistence, but also on communication between non-human or "asocial" moments that are just as important to social stability as the practices of human members of society (Schulz-Schaeffer 2000: 209). To guarantee the endurance of social relationships it is therefore not enough to rely only on human collaborations. Rather the focus must be shifted, as Latour also says, from the human to the non-human. Key to the social theory of actor-network-theory is that all social interactions must be delineated as a coevolutionary result of society, nature, and technology (ibid.).

At the same time, something in the symmetry of human/non-human has not been thought to the end, for the hyphen that connects and separates the actor-network remains undefined. While indeterminacy makes polyvalence possible by expanding social relationships to include the non-social, an explication of their relation and its modalities is still necessary. This is all the more true when contrasted with interpersonal relationships, which are founded on communication and cooperation and for their part formulate the conditions needed to enter into connections, whether social or asocial. It is also necessary to differentiate between relations and relationships, for every relationship references a core alterity that exudes an attraction that draws us into a relationship. From the beginning we are dealing with an arch-passivity (Blanchot) that determines the relationship according to what

6 On the concept of a *Verständigungsgemeinschaft or Kommunikationsgemeinschaft* see Apel 1986.

it refers to, while relations are formal assignations such as those that define mathematical functions. These cannot be conflated into one, so that in the ecologies of the human and the non-human and their concurrent ensembles, we must differentiate between human-human relationships, human-object or human-technology relationships, and object-object relations. κοινωνία refers in the main to the first two, while the latter belongs at best to the more or less contingent complex of conditions.

This makes clear the internal problems of network theories as formal conceptualizations of κοινωνία. They imply an exclusion that proves inconsistent in that no network can recognize that it is a network, as it has no consciousness of where it begins or ends, whereas knowledge and self-knowledge have always been intrinsic elements of social interconnections. No holism can see itself as a whole and delineate its limits, so that the supposed relational egalitarianism of the net and its equally supposed egalitarian participative nature make up their own kind of atrophied stage of the social world, because they can encompass only *relations,* which however fall under the same formal schemata and thus tend not to be able to concretize their practices.[7] κοινωνία, like sociality in general, consequently shrinks to become a restricted code. Relationality and participation alone are not enough to compensate for the *maleficium* of the net. Firstly, because the non-human can still only be conceived from the perspective of the human, and the post-human extension takes place by the will of humans, and, secondly, because terms such as "collective," "association," or "participation" prove to be symptomatic of a social condition that is in the process of restructuring to become solely technological. What become conspicuous, and what systematically falls through the cracks of these categories, are the types of relations that seem indispensable for the constitution of the social. To these belong, alongside trust, the ethics of the gift and, in particular, the political ethics of justice, which cannot be fulfilled by taking apart and taking part because κοινωνία, like democracy, is first and foremost an ethical and a legal concept.

The truly explosive nature of the question is found at the site where Latour's terms are radicalized within cultural and media studies, simultaneously eradicating their genuine social-philosophical impetus (Thielman Schröter 2014: 148–158). Even if Bernhard Siegert and Lorenz Engell (2013: 5) have called actor-network-theory "one of the most interesting conjunctions of the cultural sciences and media studies in recent years," it is equivalent to an abuse of categories when "symmetrical anthropology" is cast as an "actor-media-theory" and the idea of networks is glibly applied to "medial actors" and their connectivity (Schüttpelz 2013). These are understood primarily as "cultural technologies" that first broadcast art, science, history, or thought and observation—a totalization that ignores that every technological invention is already in the arena of cooperation, which in turn is unthinkable without κοινωνία. When today media studies and cultural studies frame themselves as the theoretical avant-garde and assume a materialistic "apriority of technicity" and therefore also an implicit technological anthropology with all of the attributes of determinism, then it should be remembered that they do not possess an adequate concept of the social. Media and cultural studies seem as it were to be blind in the social eye. This broaches the question of the fate of κοινωνία under technological and medial conditions, as well as its representation in networks whose graphs can perhaps connect communication tools, technical objects, archives, smart things, operative systems or gadgets and, especially, algorithms, artificial figures and techno-imaginative androids and even sometimes also people, but do not come close to that which makes connections special and makes them connect us.

This is betrayed by the most common terminology, particularly "operativity" "circuits," "interfaces," and the like. These terms correlate strangely with the aforementioned reveries of counter-cultures at the time of the watershed invention of the PC, a caesura in computer history. In the meanwhile, these computer environments have received exponential upgrades including ubiquitous sensor technology, databases, digital statistics, and artificial intelligence, while remaining oddly alienated socially. Taken on by theories of media and culture, this terminology has also been taken for a ride, or corrupted by

7 "Literally there is nothing but networks, there is nothing in between them, or, to use a metaphor from the history of physics, there is no aether in which the networks should be immersed. In this sense AT is a reductionist and relativist theory, but as I shall demonstrate this is the first necessary step towards an irreductionist and relationist ontology." (Latour 1996: 372)

these disciplines. The so-called social media in particular—which in reality are singularly asocial—are the perfect illustration of what happens when all there is networks with nothing "between them"—no "aether" and also no other binding media. All that connects them is formal graphs as well as "nodes" and "edges" which in turn cannot be described on the foundation of the same graphic network repertoire but do reveal the social ruin created by pure formalism. One must think of κοινωνία under technological conditions as a network, which conversely makes clear that it has lost its essential essence, namely acting as a "force" that allows for "assembly" and embodies the "common," and has instead abdicated it to an "image" or an external structure.

In fact, although technological network metaphors seem to underscore connectivity, they preserve that which is insufficient in them, because they form an abstract concept that is modelled by diagrams that only portray their temporary and local connections without providing any information about what kind of linkages they are, or via which paths these linkages come to be. It is decisive that the operationalist framework of technologies, as well as the relational model of network theories, do not even come close to being able to conceptualize a non-formalist, which always means *performative* concept of *relationship,* which is more than just an interface and an interaction-network. κοινωνία in this conception is nothing more than a blueprint that can be laid over all kinds of social processes like a map, but that moves further and further away from us the farther its formalism progresses. For as a blueprint, it offers no more than a virtuality; a plan that says what could be *built* but not how it should be built on a *practical* level. At best it gives those who know how to use it a vague orientation, just as it confuses those who cannot decipher it. Instead, we should hold fast to the task of granting a specific reality to the social and with it to κοινωνία *as a practice.*

POSTSCRIPTUM

The seemingly abstract reflections on the constitution of sociality and its central concepts, such as communication, trust, cohesion, reliability, and the like—in one word, the κοινωνία—directly concern the issue of living together under technological conditions, with possible encounters between humans and nonhuman beings including decision-making robots, avatars, or other artificial creations, as well as with autonomous agents such as self-driving cars. Posthumanism has placed such encounters under the radical perspective of their ontological egalitarianism. The fact that we (as human beings) are together with nonhuman entities in the same way that we are together with other human beings decenters our primary role in the world and disempowers the claims of classical humanism (Mersch 2022). In turn, the critical attitude of decentering implies a rejection of domination: it devalues our power relations and, according to Latour (1996, 2005), places our actions back into a network of equality among different actors, human and non-human. But the critique does not touch the problem of "relationship" (which is more than just a "relation") and thus of sociality and the question of whether the human—non-human relations can be considered under the same auspices and values as human—human relationships. The terms "relation" and "relationship"—or in German: *Relation* and *Beziehung,* which contains the word *ziehen* or "to pull"—need to be distinguished, as the first denotes only a formal function, while the second implies a force that asks or invites me to relate. Therefore, the suspicion arises that we behave differently towards other humans than towards objects or non-human actors—no matter how much they are endowed with "intelligence" or an autonomous decision-making capacity. Obviously the social, in terms of "being with," means something completely different pertaining to human beings than in relation to nonhuman actors. Moreover, social facts are first and foremost not a matter of power, but primarily of "encounter." Thus, we can also raise the same question from another angle: What does it

mean to meet, to interact with, or to develop feelings and desire towards technical beings that are neither creatures (animals or plants) nor humans, i.e., that are not life-forms that share the experience of otherness and mortality?

Certainly, psychoanalysis has dealt with the notion of projection, which seems to correspond to our psychic nature as it constantly approaches pathology, fetishism and inappropriate anthropomorphism. In this respect we are surely able to engage with objects emotionally, lending them attention and appreciation; we may even love them like the automatic voice in the film *Her* (2013), but this signifies neither a reciprocal relationship nor a social connection, for sociality depends on mutual recognition, on the mirror experience of equality, on cooperation and the need for community with its cultural norms, rules, and values, and above all on the asymmetrical relation of responsivity that allows for self-understanding and gives birth to true responsibility. Can this apply in the same way to technical artifacts like avatars as it does to our fellow humans, to our "neighbors" *(Nächste)?* Is confusion between artificial beings and real persons conceivable? Is a non-pathological longing for acceptance by an artificial being, triggering in us the desire for response and attention, even possible? What if we encounter avatars that ostentatiously turn away from us, ignore us? Do we feel insulted or simply indifferent? And what does non-indifference mean pertaining to things; what kind of sociality is it if we prefer to surround and converse solely with avatars or other artifacts? Can, under such conditions, the tremendous loneliness of self-encounter ever be overcome?

FIGS. 1, 2 FUTURE PROJECTIONS OF VIRTUAL MEETINGS.

The questions at stake tackle the meaning of the social in the face of a dissolution of any distinction between the human and the non-human, which already implies the complete dissolution of any meaning of humanity as well. These questions arise concretely against the background of so-called "social" media, the internet as a primordial tool of exchange, engagement, and interaction, and, above all, a pervasive "avatarization" of personal relationships. Can the concept and experience of the social then retain the same significance as that which we once gave to various expressions such as "community," "society," or even "congregation" or "commune"? These have always had a political as well as a religious and legal meaning; but since there are technical artifacts that seem to speak, act, and think—obviously all these concepts are misleading—the psychoanalytic term of projection, which has always described a subconscious relation, is no longer sufficient to do justice to the situation. Rather, what is needed is a deeper analysis of different *modes of encounter* (instead of modes of "existence"), which includes the broader questions of what it means to be "in communion" with artificial beings and whether it is possible to enter into political relations with them or to cooperate with them emotionally. The obvious problem, then, is: What remains of the social when our primary "society" consists almost entirely of technical relations using technological beings?

One could dismiss this elaboration regarding possible relations or relationships with avatars—or "rendez-vous," as Jean-Luc Nancy (2021) calls them—as exaggerated or unreal and relegate it to the narratives of science fiction. However, since Mark Zuckerberg wants to expand Facebook from a "social medium" to what he calls a "Metaverse" (following the model of the online game Second Life, which will have been its naive design precursor, as it were) that consists of a *complete virtualization of social life,* so that we transform ourselves into photorealistic avatars who meet with other avatars in imaginary landscapes or workspaces, the question of face-to-face encounters in particular has gained a new topicality and dimension.[8] It will arise with real urgency in the near future. Will such virtual encounters harm or affect or even destroy our social abilities, which depend on the indispensability of other humans being present in terms of direct contact, physicality, and the desire to be touched—rather than simply be connected? While Zuckerberg in his video promotion of the Metaverse explicitly emphasizes the "feeling of presence" as the "defining quality of the Metaverse"—"you are going to really feel like you're there with other people, you'll see their facial expressions, you'll see their body language (…), all the subtle ways that we communicate that today's technology can't quite deliver"[9]—these facial expressions and body language are simple *perceived* from a distance and reduced to *visual* communication, simultaneously subtracting the essence of a true encounter. Every detail, the entire private ecosystem, is subject to our defining power and control, so that we are dealing with a fundamental attack on reality, which is replaced with a second, artificially constructed one. This corresponds to the fact that to make the illusion possible we also entrench ourselves behind VR headsets, which thus become an emblem of a displacement of the world, sealing us off from the gaze of the Other. Coincidence, deviance, the unpredictable and unavailable as necessary dimensions of the social are thus carefully eradicated and erased. The future of social Amedia clearly lies in the establishment of an ongoing "digital playground."

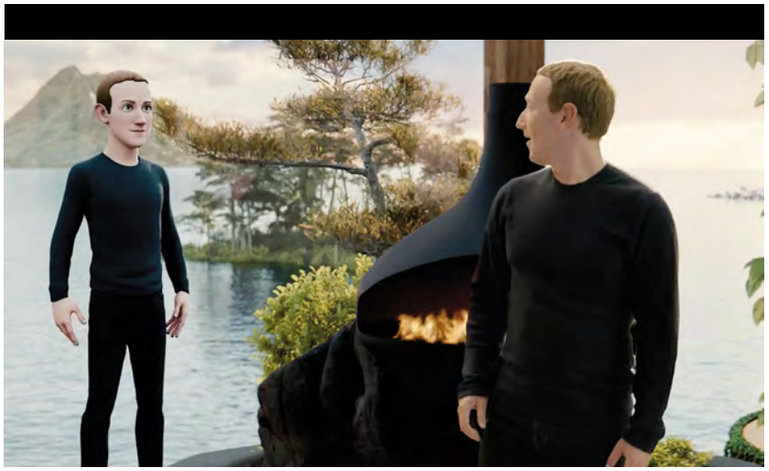

FIG. 3
MARC ZUCKERBERG MIRRORING HIMSELF IN HIS VISION OF THE "METAVERSE."

Unlike robots or autonomous agents, avatars are screen beings; they form figures that are virtual representations, reduced to mere visuality. They rely on digital simulations with computed expressions and gestures, whereas interpersonal encounter is based on bodily co-presence with attributes such as fragility, vulnerability, but also defensiveness, shame, or shyness, attributes that remain unknown to "avatarian" representations. Their technical realizations are limited to scans or motion-capture systems, which are supposed to guarantee an optimized performance of their "as-if," the prototype for which originated from animated films or computer games. However, the contorting of certain facial muscles or the execution of specific hand movements alone do not reveal any "motion" of emotions, no inner movement, let alone moods and their ambiguities.

Yet it is not only avatars with whom communication is planned, but also holograms. Beyond screen representations, experiments are being carried out on stage as in the planned "ABBA comeback tour" in London starting in May 2022.[10] Whatever the "ABBAtars" used in these events are, they present themselves as so-called "real avatars," separated from the audience by the "fourth wall" of the show. Thus, they remain, as in the envisaged Metaverse

8 See for instance https://www.youtube.com/watch?v=b9vWShsmE20 (accessed February 10, 2022).

9 Ibid. 2:10–2:35. Curiously enough, in the video, Zuckerberg has already completed his transformation process into an avatar: he is the avatar that he is promoting.

10 See https://abbavoyage.com/ (accessed February 10, 2022).

meeting, virtual images that have no body and thus no body feeling, no body scheme, and therefore also no expressive qualities. Accordingly, there is no closeness or bonding, because if we want to reach for them, we reach through them into the void. The encounter thus exists only superficially, an imitation or pure shadow of real physical touch with all its imponderables and subtleties. Instead, it satisfies the criterion of similarity, of deception — the form of imitation and pretense that has dominated digitization right from the start. Look, for instance, at Alan Turing (1950), who, in order to answer the question of whether or not machines could be intelligent, proposed an imitation game that aims at nothing less than to lure us into a trap (Longo 2019).

The relationship with Others who, unlike mere images or surfaces, remain, as Emmanuel Lévinas has described, pure "enigmas" that address us, haunt us, or challenge us, is something completely different from any as-if or virtual game, containing as it does possibilities that may or may not occur. Such a relationship implies a "bindingness" that cannot be evaded, which consequently always already contains commitment and obligation, whereas virtual representations induce nothing like that. Can sympathy arise under the condition of virtuality? Trust? Pity? Care or concern? Or desire and love? The designers and engineers — the self-proclaimed elite of the digital age — usually answer these questions with the suggestive counter-question: "Why not …?" In this way, they already manifest that they have lost touch with others, with what is meant by a "social relationship" in its emphatic sense, because they judge solely from the perspective of a methodical solipsism, *as if* we were fundamentally detached and enclosed in our world, and *as if* it were our decision to whom we want to turn, instead of having always already interacted with "others," our fellow human beings. Ignorance or heedlessness is not an option in the social, because we are only human as far as we belong to others. On the other hand, to be in the company of avatars, to deal with them "like others," corresponds to a primary indifference — the awareness, that none of it is "real" — that has already gamified the social and subjected it to mutual staging and self-presentation. This applies equally to the schizophrenogenic confrontation with ourselves as avatars, who — unlike the doppelganger — are hardly able to unsettle us, because as bodies we always know when we are *among* or *with* other bodies, or only with ghostly apparitions. But the fact that the Metaverse primarily revolves around our self-presentation and egocentrism, sublimated by auto-avatarization, already underscores the fact that others are at best vehicles to equip our stage and enable our performances. The social shrinks structurally to the functions of our own ego-performance (as Zuckerberg shows).

FIG. 4
SCENE FROM THE TRAILER FOR THE ABBA TOUR, PLANNED FOR MAY 2022 IN LONDON.

Posthumanists and some media and cultural studies scholars who instead assume a future destabilization of our well-accustomed certainties — the "disappearance of the real" or the dissolution of classical distinctions such as that between being and appearance, original and copy, truth and lie, or subject and object, nature and culture, and human and non-human — have not seriously learned their own deconstructive lessons and have not understood their own critiques. The collapse of differences that they proclaimed applies at best to screen media or the technical illusionary machinery. Today's theater, after a phase of extreme asceticism in the 1970s and 80s, has also turned to technological fascination and is increasingly striving to transform itself into spectacle. But in the face of the screens or technical effects, the pleasure in deception dominates, because it is solely based in the eye

and the ear of the beholder, so that the prognosis of the collapse of differences corresponds more to a wishful image than to reality. Admittedly, we are deceivable and also deception-ready beings, with, as Friedrich Nietzsche expressed in his early text "On truth and lie in the extra-moral sense" (1873), a pronounced will to lie, to fiction — but this can only succeed where we rely on technical reproducibility and its assigned senses, while in turn all senses of "distancelessness" such as haptics, tactility, smell, and taste are simultaneously excluded, for it is these that structure our experience of reality as an experience of existence in the first place (Mersch 2002: 30–42). We do not, of course, fail to recognize the existence of "absolute deception" through DeepFake: consider, for example, the website "This person does not exist," with nothing but imaginary photographs of non-existent persons generated by Artificial Intelligence, which remain indistinguishable from "real" ones.[11] The danger they pose is great, but they primarily expose us to a visual Turing test, which, however, already presupposes the senses of sight and hearing, cutting off any *synesthesia*. Thus, in fact, any technical illusionism is governed by a reductionism — not only aesthetic — which, as magic, always tries to erect a dazzle in front of us in order to render us blind to transparency and critical reflection.

In opposition to this, the aforementioned "existential senses," above all touch, offer a corrective. They likewise teach a correction vis-à-vis the avatarization of the social, so that the alleged collapse of differences fails to take place. Instead, its exaggeration can only take hold where we allow the technically superimposed eyes and ears to usurp our ways of experiencing the world and ourselves, that is, where the power fantasies of technology have taken hold in such a way that we distrust the sovereignty of perception and find ourselves outside of what must be understood as an actual "bodily encounter." This encounter proves to be just as constitutive for the facticity of the social as for alterity and responsivity as the elementary references to others in terms of the always elusive *otherness*. Avatars instead deny any alterity, or rather: they are — unseeing and never truly seen — "apparent others" (in the double sense of appearance and semblance, of visual gloss and deception), incomparable with human companions, reduced to the mathematical modeling of their skin as well as the computation of sounds and movements, whose intonation, expression, and gesture — however perfectly imitated — remain clumsy and who, in one word, are not "aliens" to us, but at best "alienating".

In contrast, in one of his last conversations with the art-historian Carolin Meister, Jean-Luc Nancy (Nancy/Meister 2021) insisted that "encountering each other" presupposes a "togetherness" that is always already embedded in social reciprocity. This turns out to be rudimentary in the confrontation with avatars. According to Nancy, encounters possess something "irreducible" and "inexplicable" (ibid.: 9); they are event-like, because we can neither reckon with them nor anticipate them. "Encounter does not constitute precisely a relation, neither connection nor communication, but rather a challenge to all these terms" (ibid.: 11) — here understanding the notion of relation as a formal relationality. Perhaps, therefore, it would be more accurate to say that the encounter provokes what technically appears to be an interaction; for its event, Nancy continues, is "entirely on the side of the unexpected, the accidental"; consequently, it is something "that happens to us" (ibid.: 16) and thus takes place at the level of the "It" — or rather, "between fragments, moments, or aspects of the 'It'" (ibid.: 24). Every encounter, therefore, proves mysterious, incomprehensible, and impenetrable: "[It] will never attain clarity about itself" (ibid.), for it is — through the Other and its unknowability, its invisibility — always resistant to us and to our desires, remaining beyond what can be known or apprehended by consciousness: "The two of an encounter have before them and within them — and likewise between them — the entire human population" and indeed "humanity" in general (ibid.: 31).

This cannot be said of an interaction with avatars, even for "real-time" avatars that are based on an instant avatarization of ourselves. No matter how much it may seem as if something unexpected lies in their appearance as well, what appears turns out to be thoroughly controlled by the camera we use and pre-determined by the computational power of the

11 See https://this-person-does-not-exist.com/de (accessed February 10, 2022).

underlying program. They lack the subtlety of physical tension, nuance, and traces of an unconscious, because they can only represent — within the realm of visual resolution — what can be digitally calculated. Founded on operational functions, they also lack the temporality and history that would first and foremost give them depth. It is this lack of depth that thwarts any "encounter" in the proper sense, which would unintentionally reverberate on the experience of the persons the avatars purport to represent. Therefore, as Nancy states in his conversation with Meister, "(p)erhaps it must be said that there is no encounter within mathematics (…), and that there is equally no encounter between the mathematical or mathematized sphere and the life-world or the world of language" (ibid.: 45). The foregrounding of non-human behavior thereby blots out the background of human intentions and their vagueness and unfathomability in such a way that, disguised as avatars, we are never present and thus never able to meet entirely in the sense of involving all the senses, precisely also the hidden ones and their libidinal or confused signatures. It is this that constitutes the charm or magic of an encounter in the first place.

This also means that the replacement of the social with avatarized contact, as envisioned by future internet platforms such as the Metaverse, leaves little of what constitutes sociality — much less than already remains today of understanding under the umbrella of ubiquitous communication media. What was once intended to enable connection proves, in the context of rampant hate messages, to be the exact opposite: an excess of social polarization, and this is even more true for virtual realms such as the Metaverse and similar Silicon Valley creations. Thus, when Nancy and Meister say "I am all the more me when I encounter you" (ibid.: 76), in order to indicate that social bridges exist only where we are already together "in relationship," where we are committed to others from the beginning, the statement must be read in the context of an avatarization as: "I am all the more me when I play 'me' in front of 'you' as my audience." As avatars we "perform each other," rather than encounter the other. The two propositions formulate separate worlds, which renders the rift, the gap or difference, between two understandings of the collective absolute. In this situation, the significance of κοινωνία can no longer be reconstructed.

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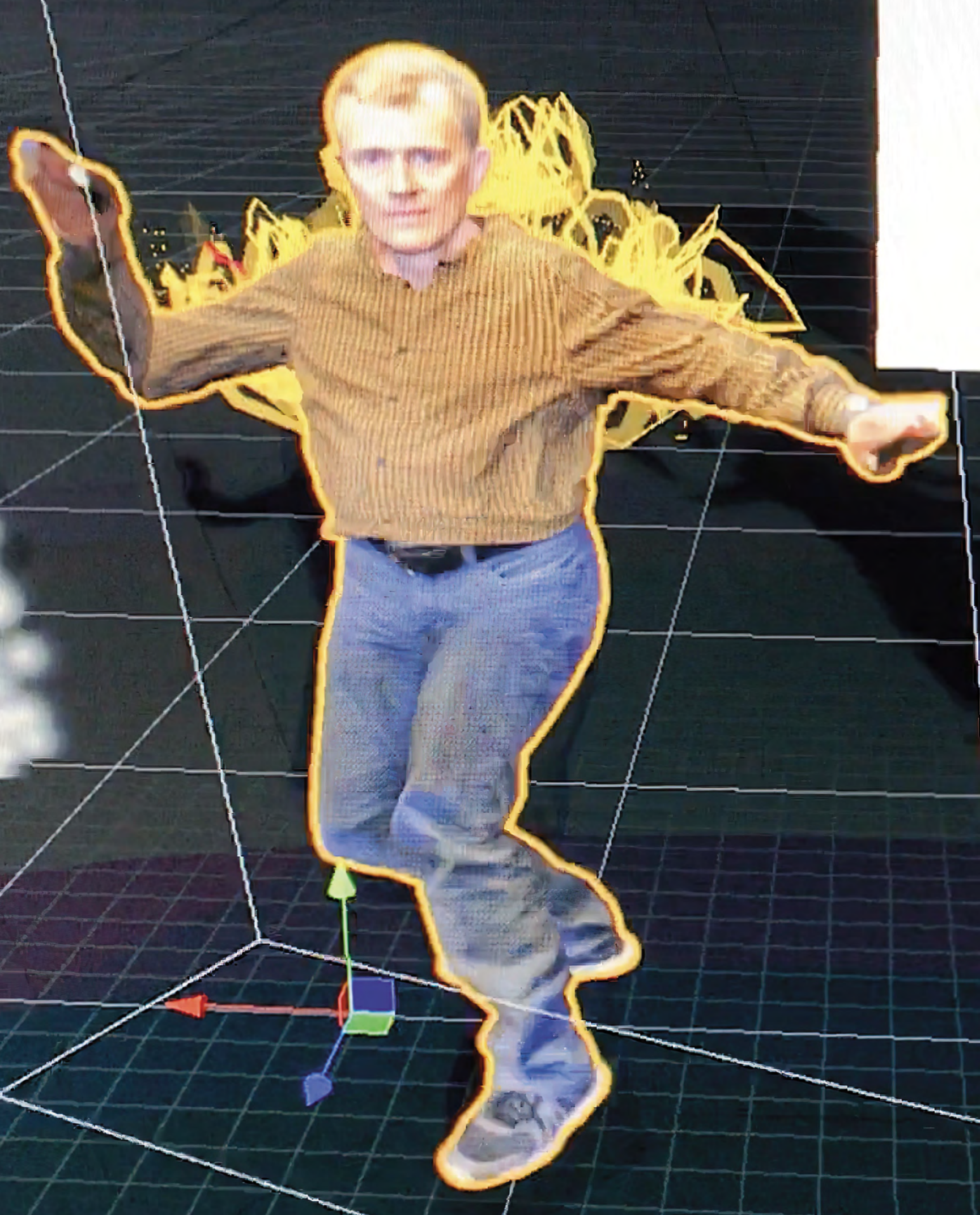
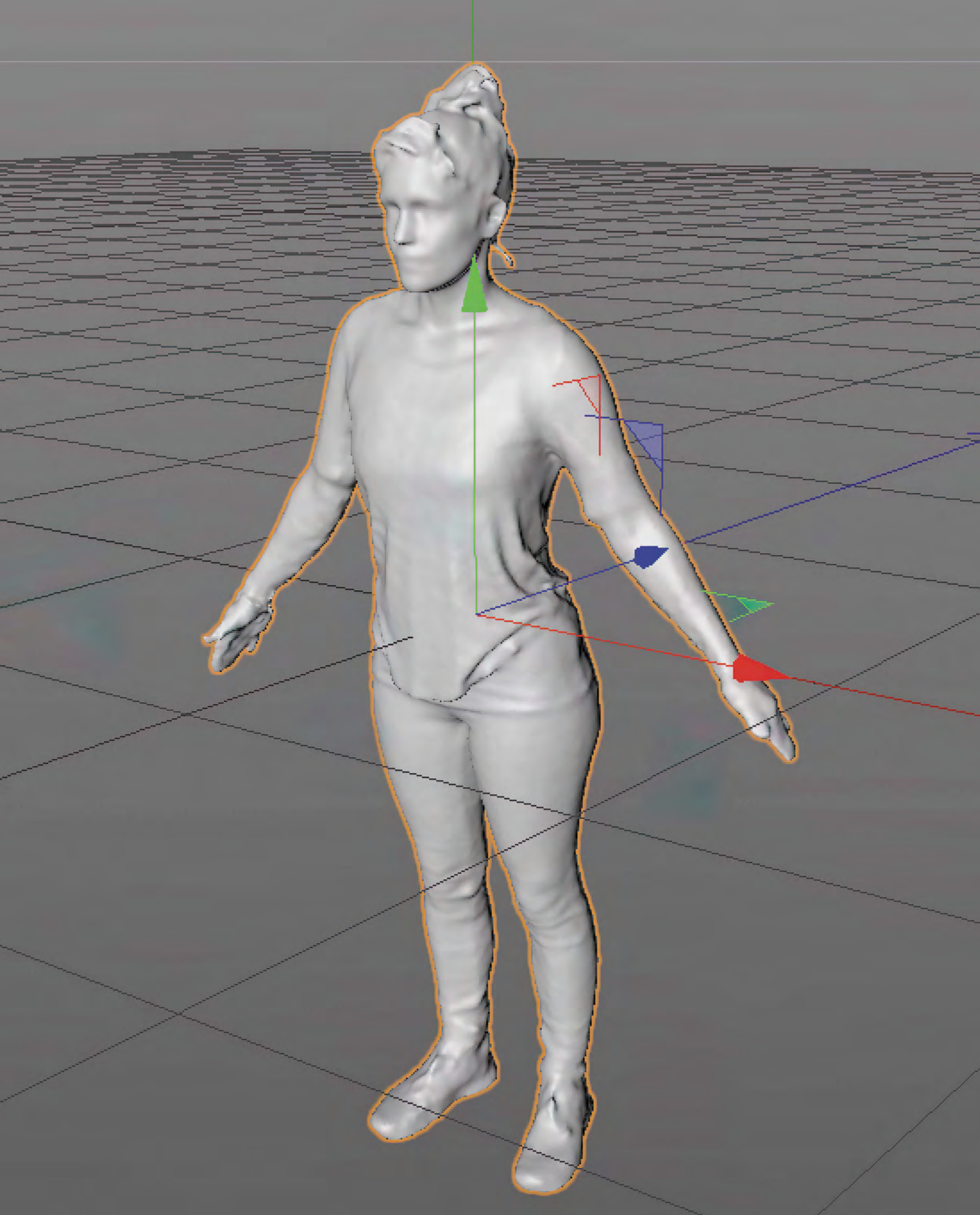
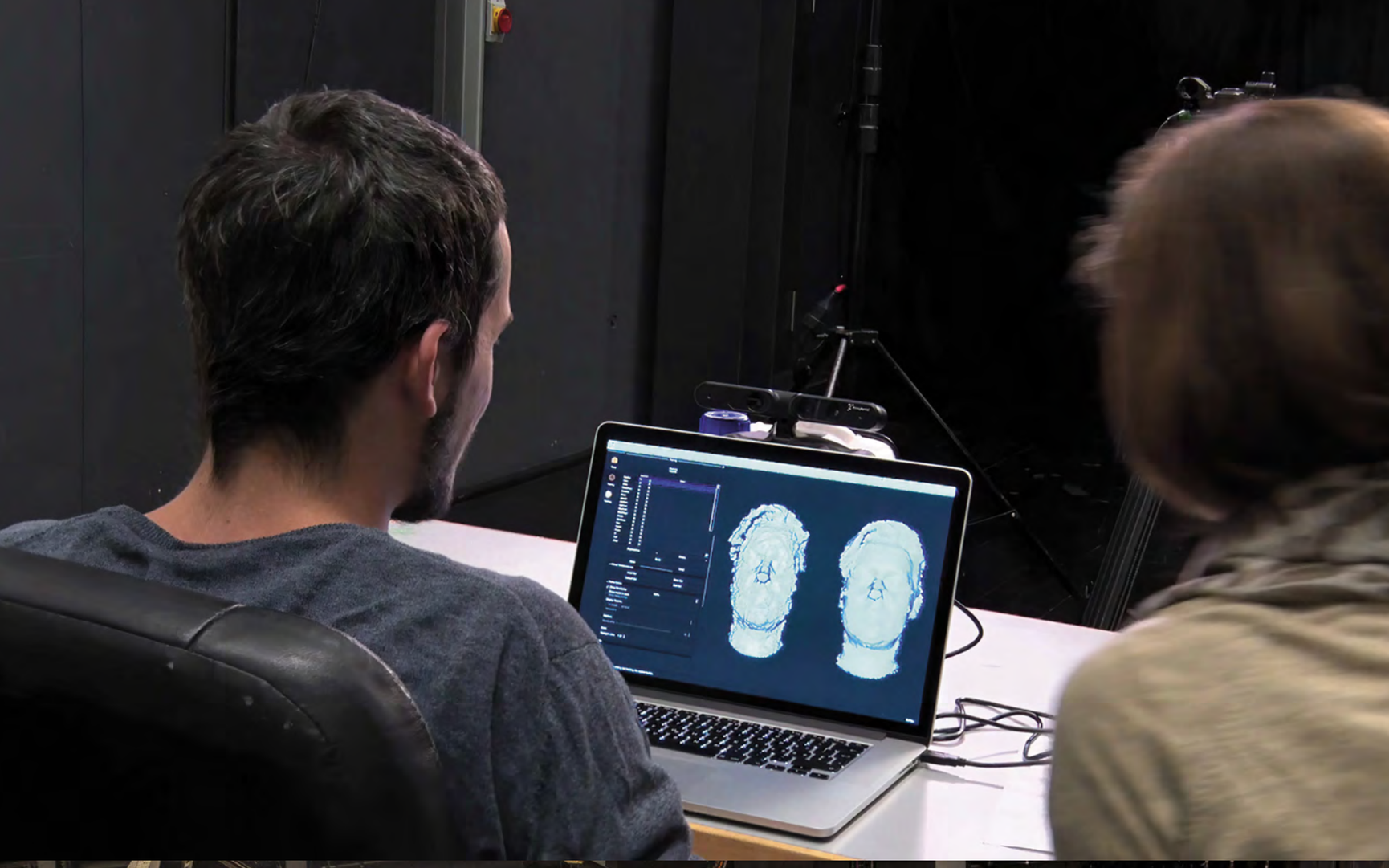
APPENDIX

PICTURES OF THE RESEARCH PROJECT

(WITHOUT COMMENT)





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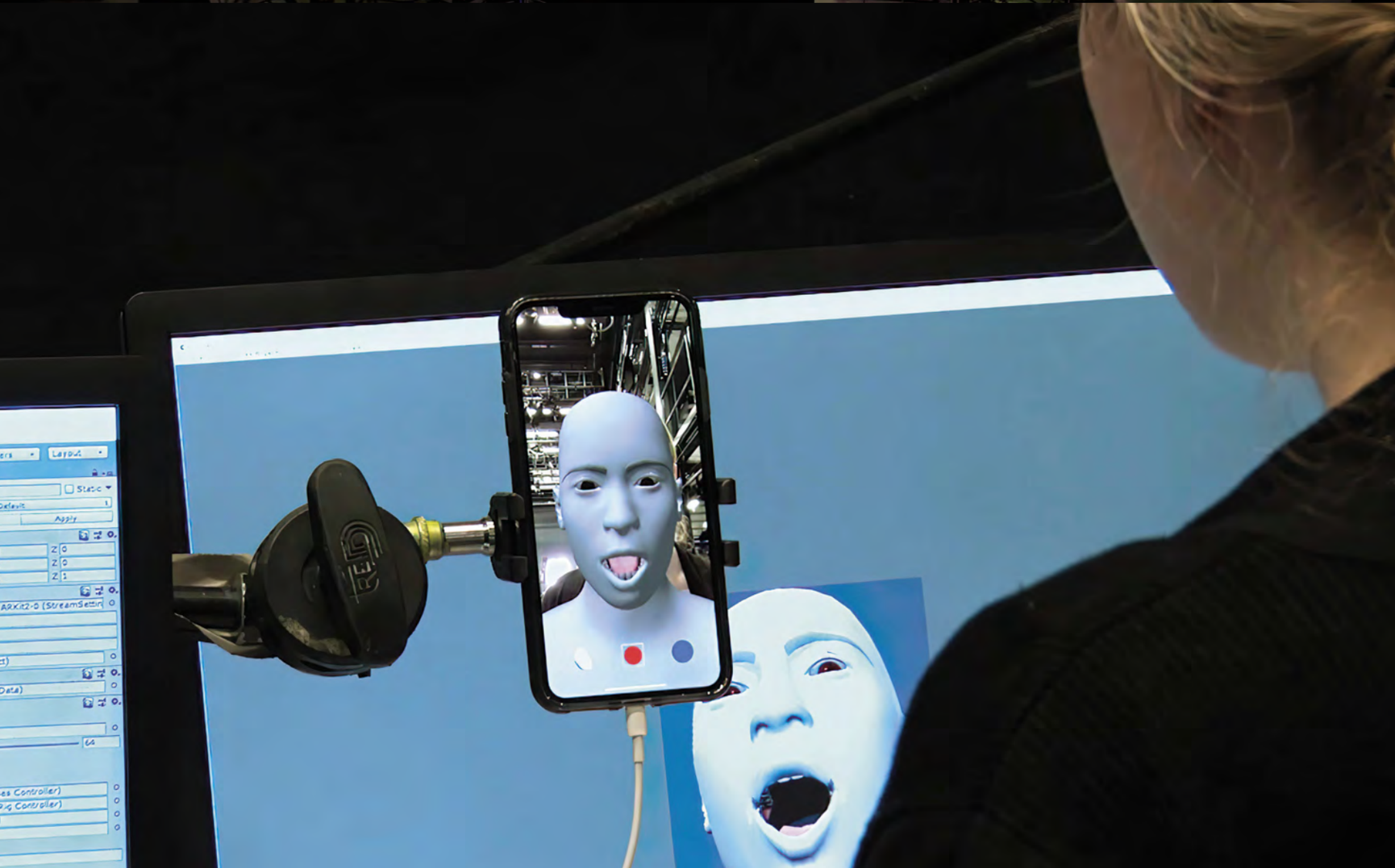
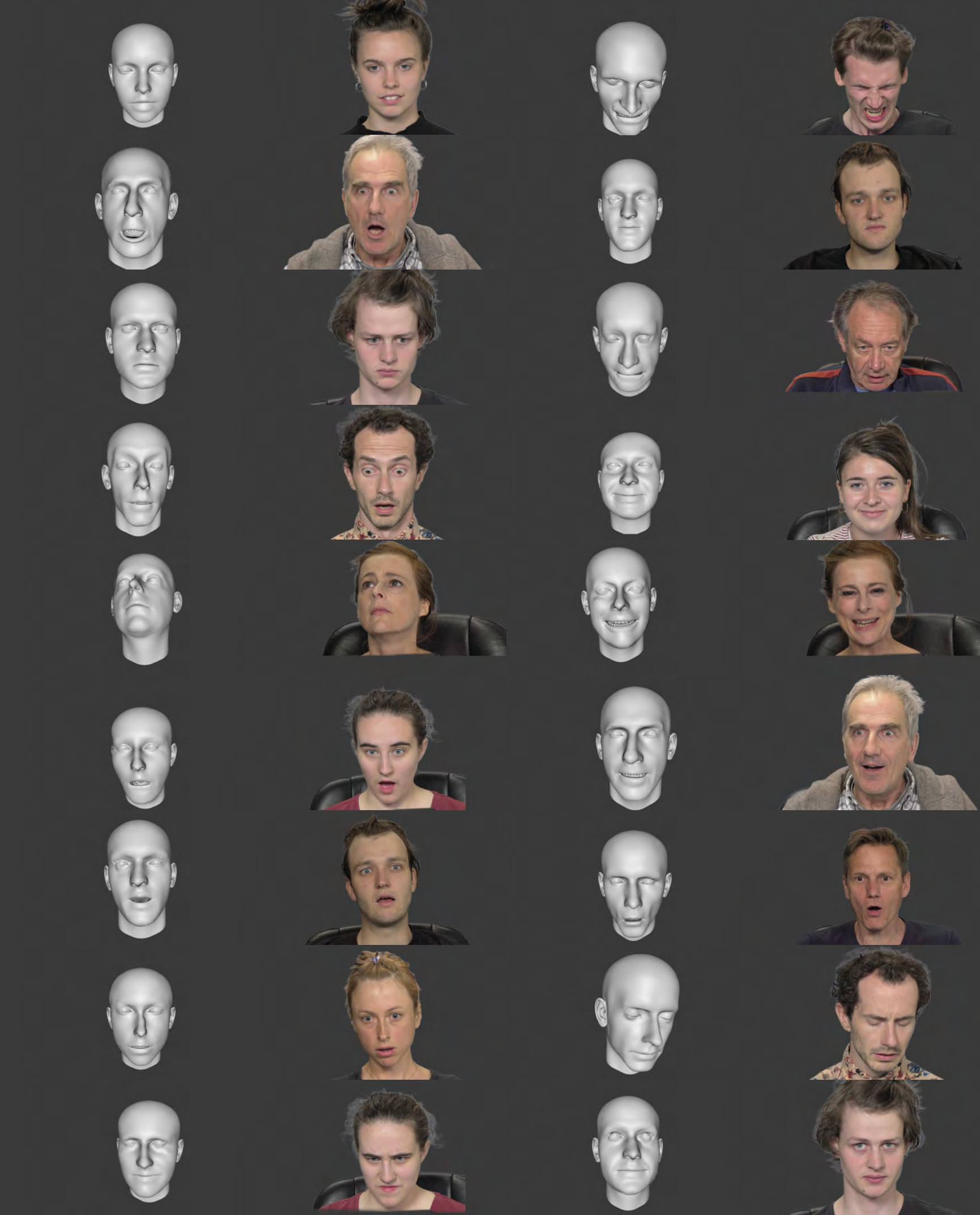


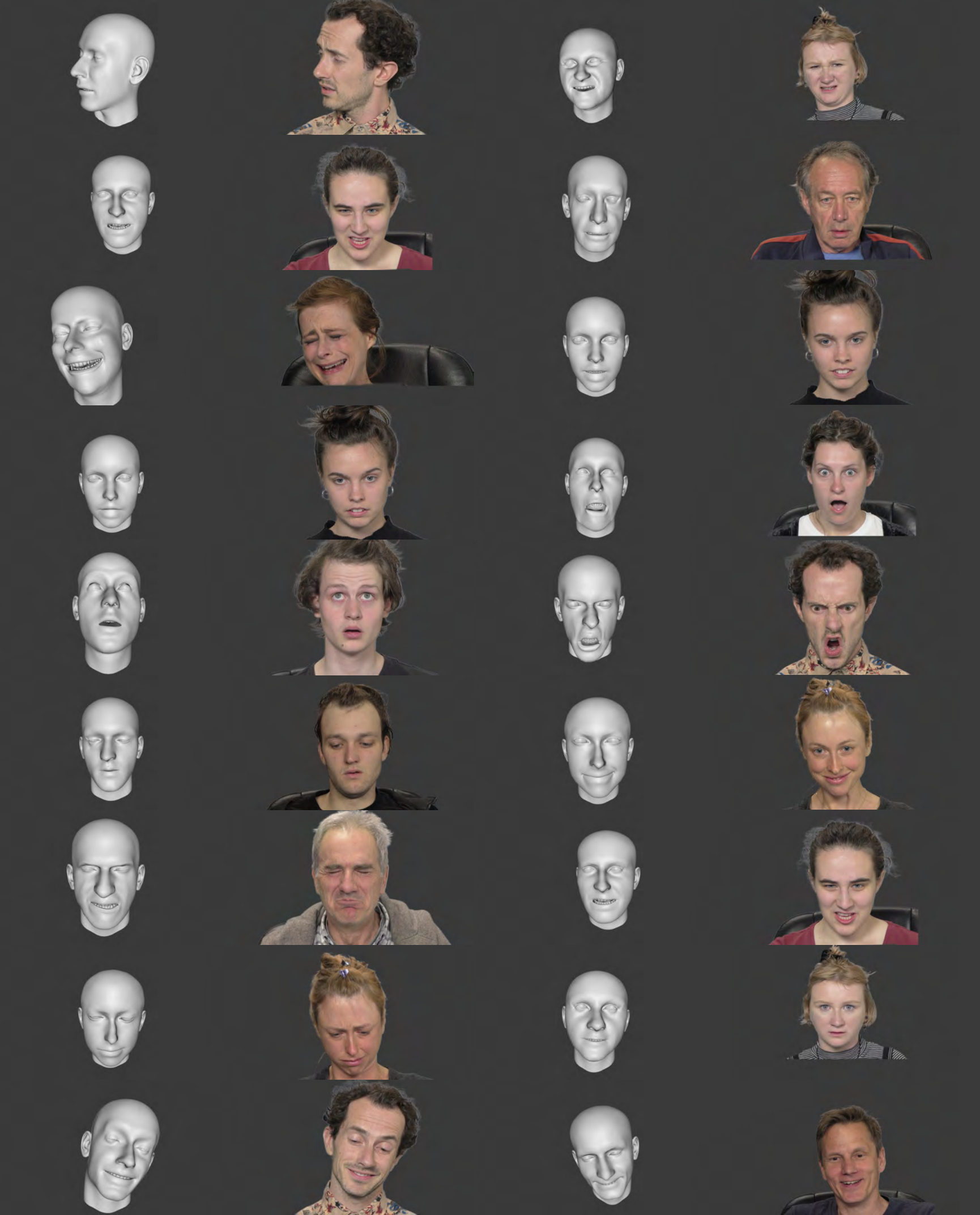

FaceRig
Face Tracker
Initializing
No sound detected. Please calibrate Noise Gate Threshold


PHILIPS


Perspective 29°
Photos


Perspective 29°
Photos





DECONSTRUCTING THE CONFESSIONAL, END OF THE INSTALLATION "THE ART IS PRESENT (CONFESS YOUR SELF & THE PALIMPSEST OF SELVES)" AT THE RESEARCH PAVILION IN VENICE, ITALY 2017

IMAGE GALLERY

Workshop “Mimic Yourself” at Zurich University of the Arts.

Photogrammetric scans of actors at Zurich University of the Arts.

Avatar composition of actress Corinne Soland for the programme FaceRig.

Performance capture with acting students at the Immersive Arts Space and the Film Studio at Zurich University of the Arts.

fMRI setting at Swiss Epilepsy Center at Klinik Lengg in Zurich.

Faceshift composition with acting students.

Guest appearance at the Biennale in Venezia, Italy

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MATTHIAS WITTMANN

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The subTexte series of the IPF-Institute for the Performing Arts and Film, is dedicated to presenting original research within two fields of inquiry: Performative Practice and Film. The series offers a platform for the publication of texts, images, or digital media emerging from research on, for, or through the performative arts or film. The series contributes to promoting practice-based art research beyond the ephemeral event and the isolated monograph, to reporting intermediate research findings, and to opening up comparative perspectives. From conference proceedings to collections of materials, subTexte gathers a diverse and manifold reflections on, and approaches to, the performative arts and film.

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Zürcher Hochschule der Künste
Zurich University of the Arts

Swiss National
Science Foundation

This Open Access edition was initiated by the Zurich University of the Arts (ZHdK) and published with the support of the Swiss National Science Foundation (SNSF)

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche National- bibliografie; detailed bibliographic data are available on the Internet at http:// dnb.d-nb.de

First published in 2023 by transcript Verlag, Bielefeld

Cover illustration (based on a portrait of Peter Ender),
Layout & graphic design: Agnes Weber, Bern
Translations: Laura Radosh, Berlin
Production managed by Die Produktion, Düsseldorf

Print-ISBN 978-3-8376-6761-5
PDF-ISBN 978-3-8394-6761-9

https://doi.org/10.14361/9783839467619

Printed on permanent acid-free text paper.