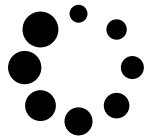# What to do in/with images? The (virtual) hand in augmented and virtual reality

by Julia Reich

Immersive experience
Virtual reality
Augmented reality
Virtual hand
Contemporary art

What to do in /with images? The (virtual) hand in augmented and virtual reality.

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Abstract

This paper focuses on the concept of acting with and in images in the context of recent AR and VR artworks. The thesis is that the (virtual) hand plays a significant role in an immersive experience. Referring to Doris Kolesch's relational concept of immersion as one that considers not only the status of *being evolved* but also the process of *getting inside,* three forms of actions in and with images are discussed: the hand as stage, the hand as a symbiotic contact zone, and the hand as a designing hand. With artworks by Jeremy Bailey, Aristarkh Chernyshev, Rachel Rossin, and Florian Meisenberg, this contribution aims to contour the forms of action in which the (virtual) hand, in particular, allows an immersive experience by interaction with the virtual sphere and knows how to combine distance with nearness.

"Viewing is already an activity, and distance from the work is its necessary condition. Immersion? Not necessary. We are already in the picture."[1] With these words, Peter Geimer ends his polemical assessment of the immersion trend in contemporary art and in exhibitions. His critique, published almost five years ago, is mainly directed at the seemingly obstructive distance between the visitor and the artwork, as well as at the artistic and curatorial unreflected affirmation of an immersion-based paradigm of experience. What was considered hype at the time, however, as Oliver Grau's art historical genealogy of virtual art impressively unfolds,[2] turns out to be neither new nor based purely on media technology. Rather, the increased emergence from a temporal distance suggests itself as the advance of a second virtuality boom in the art and cultural landscape, which has become a matter of course today, and which was additionally fueled by the Covid-19 pandemic. While the pandemic caused the entire global society to practice social distancing, immersive technologies, such as virtual reality (VR) and augmented reality (AR), that challenge the polarity of close and far, not only became increasingly prevalent in the field of art but also obtained an impact in our everyday lives. Whether in regard to medical applications or in the context of commercial instruments, these immersive scenarios permeate our life worlds.[3] In contrast to the first wave of virtuality in the 1990s, whose discursive tenor tended to emphasize the otherworldly and spectacular, AR and VR technologies have recently been used by artists to highlight the fragility and permeability between

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1 P. Geimer, "Kunst und Immersion: Der Trend zum Bildersturm," *FAZ* (July 23, 2018), https://www.faz.net/aktuell/feuilleton/kunst-und-architektur/was-soll-der-trend-zur-immersion-in-der-kunst-15701142.html, accessed April 23, 2023 [my translation].
2 The author begins his genealogical analysis of virtual reality in art with the example of the pre-Christian Pompeian Villa dei Misteri and includes analog as well as digital simulation spaces. Cfr. O. Grau, *Virtual Art: From Illusion to Immersion* (Cambridge MA: MIT Press, 2003).
3 Cfr. S. Rieger, A. Schäfer, A. Tuschling, eds., *Virtuelle Lebenswelten: Körper – Räume – Affekte* (Bielefeld: Transcript, 2022). At this point, reference should also be made to the Collaborative Research Center 1567 *Virtual Lifeworlds* [*Virtuelle Lebenswelten*] at the Ruhr-University Bochum, which is dedicated to the interdisciplinary study of various manifestations of virtuality.

"art, mediating technologies, and daily life"[4] through immersive experiences. According to Doris Kolesch, immersion is foremost an experience of a "threshold and transition," a "dynamic of oscillating between embeddedness and distance, of submersion and surfacing," and less a complete absorption by the artwork.[5] While AR immerses virtual objects in the physical environment, to which users can relate in the hybrid zone of the display, VR offers the possibility of entering a completely designed visual world, that is accessible via head-mounted displays (HMD). VR and AR, with their *environmental images*[6] or hybrid image spaces, tend to locate themselves in zones of permeability and transience between the virtual and physical sphere.

Particularly in the context of virtual art forms, an artistic interest emerges in testing those threshold experiences and making them reflectible via a technically achieved nearness. And here the (virtual) hand, through its activity in immersive art forms, reduces the distance that makes a reflexive reception possible in the first place. Not only immersive-virtual works create a perceived loss of distance, but also their viewers, who enter a relationship with and into images. Immersion is thus not only defined as a media-technical *being enveloped* but is also understood as a "relational concept"[7] and, therefore, equally bound to oneself actively *getting inside*.[8] As multifaceted as the concept of immersion is, it derives from the physical process,

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4 D. Kolesch, "Immersion and Spectatorship at the Interface of Theatre, Media Tech and Daily Life: An Introduction," in D. Kolesch, T. Schütz, S. Nikoleit eds., *Staging Spectators in Immersive Performances: Commit Yourself!* (Oxon/New York: Routledge, 2019): 1-17, 9, https://doi.org/10.4324/9780429198274.

5 The author distinguishes between two variants of immersive experience, mental-psychological and perceptual-psychic situatedness. While the former primarily addresses the cognitive level, where the recipient's attention is directed, such as when reading a book, the latter promises a whole-body experience that involves the recipient as an active and essential entity. Contrary to the reproach of an unreflected appropriation, which Peter Geimer also addresses, Kolesch sees in immersive situations a potential of an "*interruption* of aesthetic illusion." D. Kolesch, "Immersion and Spectatorship": 8.

6 Image worlds in VR in particular illustrate the tendency of the image to become an environment, as they are characterized by an *unframedness, presentness and immediatness*, and in this way, make their own image status precarious. A. Pinotti, "Towards An-Iconology: The Image as Environment," *Screen 61*, no. 4 (2020): 594-603, 602, https://doi.org/10.1093/screen/hjaa060.

7 D. Kolesch, "Immersion and Spectatorship": 4.

8 T. Hochscherf, H. Kjär, P. Rupert-Kruse, "Phänomene und Medien der Immersion," in *Jahrbuch immersiver Medien: Immersion: Abgrenzung, Annäherung, Erkundung* (Kiel: Schüren, 2011): 9-18, 14, http://dx.doi.org/10.25969/mediarep/18222.

which is first and foremost a directed movement that is followed by the topos of surroundedness.

And, as quite a few works of film and art history demonstrate, the first – often exploratory and recognizing – immersive movement into unknown terrain is led by the hand[9]. By contrast, the 21st century resembles an era of the hands' oblivion [*Handvergessenheit*], as Jochen Hörisch notes.[10] According to him, it is precisely cognitively abstract, immaterial processes and values that are displacing the dimensions of handiness and craftsmanship in the (post)digital age, even though they are based on them.[11] Yet it is these aspects that seem to be emphasized in AR artworks, when one's own hand literally moves forward into the screen-viewed hybrid sphere, or when the hand in VR works takes on the function of a tool by means of hand tracking and starts to interact with virtually found objects. While so-called data gloves were already used in the early VR art of the 1990s to navigate from one space to another, the possibilities for action have multiplied considerably.[12] If one considers immersion in this sense as a bodily movement that creates a simultaneity of being here and there, of which the recipients are quite aware, then the stretching forward and pulling back of the hand seems to be paradigmatic for a perception of difference, from which a self-reflexive quality can emerge.[13]

Based on this observation, this paper focuses on the significance of the (virtual) hand and its forms of action in AR and VR art. While the concept of image act(ion) [*Bildhandlungen*] is applied to different image types and

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9 In their introduction, Burcu Dogramaci and Fabienne Liptay discuss an immersion conceptualized particular in film and in the process name various film scenes in which the sense of sight is usually doubted and therefore a reassurance by hand takes place. For example, in the case of Neo, the Matrix protagonist, who recognizes his own reality as a dream by touching a billowing mirror. Cfr. F. Liptay, B. Dogramaci, eds., *Immersion in the Visual Arts and Media* (Leiden-Boston: Brill, 2016): 1-17.
10 J. Hörisch, *Hände: Eine Kulturgeschichte* (München: Hanser, 2020): 22.
11 Ibid.
12 An early example in which data gloves were used to provide orientation and navigation in the virtual space with hand movements is Monika Fleischmann's and Wolfgang Strauss' installation *Home of the Brain* (1989-1992).
13 According to Doris Kolesch, immersion include not only the process of diving in, but also that one of surfacing, which in the case of the hand can be understood as a stretching forward and pulling back. D. Kolesch, "Immersion and spectatorship": 9.

widely discussed in the discourse of image studies and art philosophy, it can only be meaningfully related to the interactive image, according to Silvia Seja. Because only the interactive image allows an action with things, images, spaces, and bodies that are merely virtually in the image and thus present and manageable.[14] Referring to simulated scenarios, Inge Hinterwaldner points out that interactive images not only allow but also significantly shape and influence actions.[15] Users both intervene in and are influenced by the iconic configuration, as it determines the way in which they can interact with it, as is the case in AR and VR artworks.[16] Accordingly, iconicity and interactivity are reciprocal.[17]

Along with current works by Jeremy Bailey, Aristarkh Chernyshev, Rachel Rossin, and Florian Meisenberg, this contribution aims to contour the forms of action in which the (virtual) hand, in particular, allows an immersive experience in interaction with the virtual sphere and knows how to combine distance with nearness. In this context, the actions in and with images are further developed on the basis of three perspectives: the hand as a stage, the hand as a symbiotic contact zone, and the hand as a designing hand. Prior to examining these artistic works in detail, it may be useful to first explain the technological background and development, determining the importance of the hand in relation to virtual sceneries.

The (virtual) hand

The constant progress of media technology developments in the field of hand recognition seems to be something of a paradox when one considers the hands' oblivion in the 21st century, as identified by Hörisch. In

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14 S. Seja, "Der Handlungsbegriff in der Bild- und Kunstphilosophie," in I. Reichle, S. Siegel, A. Spelten, eds. *Verwandte Bilder: Die Fragen der Bildwissenschaft* (Kadmos: Berlin, 2007): 97-112, 111.
15 I. Hinterwaldner, *The Systemic Image: A New Theory of Interactive Real-Time Simulations* (2010), trans. E. Tucker (Cambridge/London: MIT Press, 2017): 229.
16 Ibid. The author emphasizes two qualities of the systematic image focusing on interaction: the presentational and the operative aspect, and therefore, highlights the image as its own interface.
17 Ibid., especially the chapter "Iconicity and Interactivity": 215-271.

February 2023, Mark Zuckerberg published a short demo video of the now-available *Direct Touch* feature for the VR headsets Meta Quest 2 and Quest Pro. The feature promises a more intuitive operation in the VR and mixed reality view,[18] via gesture control, manual scrolling, and tapping, for example, in a superimposed browser page or a basketball game. Thereby, the user's hands are tracked with external headset cameras and appear in the user's view as grayish virtual hands. What can be traced in this current example is the technological genesis of the (virtual) hand, which seems far from complete. After the first prototypes in the 1970s, the first commercial data glove developed by VPL Research was launched in 1987 and already featured gesture recognition and tactile feedback.[19] In addition to the further development of wearables and external peripherals, such as handheld controllers, vision-based tracking experiments with gesture recognition started parallel in the 1980s.[20] Dependence on previously complex calibrations and external power sources was no longer necessary with the 2013 launch of Leap Motion Technology. Although now taken for granted, for example, in VR gaming, it marked an important step towards free-hand interaction with the desktop screen and later within a VR environment. With this technology, small infrared sensors and cameras track the hands motions and visualize them in VR or desktop view. While Leap Motion Tracking is now mostly implemented in VR headsets, there have also been efforts to combine this with AR applications on private devices to provide more natural interaction with mobile AR objects.[21] In the early years, AR interaction was mainly based on physical objects with markers. More recent applications, however,

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18   In this context, the mixed reality mode is understood as an interweaving of real environment and virtual elements, which clearly comes close to the passthrough mode mentioned later, but also makes the separation to AR questionable. For this aspect, Cfr. A. Urban, J. Reich, M. van der Veen, "Passthrough: Von Portalen, Durchblicken und Übergängen zwischen den (virtuellen) Welten," *Kunstforum International 290* (2023): 86-95.
19 Cfr. P. Premaratne, *Human Computer Interaction Using Hand Gestures* (Singapur: Springer, 2014): 5-12.
20 Ibid: 12f.
21 Cfr. M. Kim, J. Y. Lee, "Touch and Hand Gesture-based Interactions for Directly Manipulating 3D Virtual Objects in Mobile Augmented Reality," *Multimed Tools Appl 75* (2016): 16529-16550, https://doi.org/10.1007/s11042-016-3355-9

increasingly use hand tracking. What this very brief outline illustrates is the increasing desire for the most device-free and intuitive handling possible in and with virtual environments, which is reflected in these technological innovations. Even if hand tracking is not an essential feature for VR applications, and 360° VR films, for example, usually manage without it, numerous research studies point to an increased sense of immersion and presence in the virtual environment with visualized hands.[22] While technological advancements have made it possible to simulate manual activity and seem to have brought the hand out of oblivion, the hand movements required in virtual environments are often different from those needed in daily life. For instance, simply flicking your index finger won't be enough to put a basketball into a basket, as *Digital Touch* simulates. Thus, while these endeavors may bring the hand out of oblivion, they still fall short of replicating true-to-life experiences. Rather, the hand seems to adapt to the existing motion patterns of the virtual hand. As will become clear in the following, the desire to hold one's own hand in the virtual world does not first arise from hand tracking but starts with image configurations that presuppose much less interaction.

The hand as stage

In the context of the *AR Biennal* (Aug. 22nd, 2021-Apr. 24th, 2022), initiated by the NRW Forum, visitors were able to explore and marvel at AR sculptures in the public spaces of Düsseldorf, Cologne, and Essen using a specially developed app on their devices. Regular strollers in the Düsseldorf Hofgarten became accustomed to people performing crazy movements with their smartphones held

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22   Cfr. G. Buckingham, "Hand Tracking for Immersive Virtual Reality: Opportunities and Challenges," *Frontiers in Virtual Real 2* (2021), https://doi.org/10.3389/frvir.2021.728461; J. N. Voigt-Antons et al., "Influence of Hand Tracking as a Way of Interaction in Virtual Reality on User Experience," *Twelfth International Conference on Quality of Multimedia Experience* (2020): 1-4, https://doi.org/10.1109/QoMEX48832.2020.9123085. For the complex discussion of immersion and presence sensations in virtual space, cfr. M. I. Berkman, E. Akan, "Presence and Immersion in Virtual Reality," in N. Lee, ed., *Encyclopedia of Computer Graphics and Games* (Cham: Springer, 2019): 1-10, https://doi.org/10.1007/978-3-319-08234-9_162-1.

high or staging themselves for a photo as if they were interacting with invisible objects. In short, these were physical actions that addressed not so much the real-life environment but rather the hybrid space of the display view. These aimed to enter the picture by anticipating the hybrid zone of the AR work, as is the case with Jeremy Bailey's oversized steel bean *YOUar, stainless steel ellipsoidal arc* (2021) (Fig.1). As expected, AR works tempt us to document that individual moment of hybrid interaction in the image space via screenshot, simply because of their genuine form of appearance in the display. This need, trained by social networks, is additionally motivated by the app's own recording function, which enables uncomplicated, one-handed screen recording while the other hand can enter into a relationship with the virtual objects.[23] Like illusionistic vacation snapshots, where different distance ratios enable one's own fingers to hold, for example, the top of the Eiffel Tower, there are numerous screenshots from the AR Biennal in which the palm acts as a stage for the augmented objects.

Unlike in photography, here the hand becomes the ground for the figure, making it part of the environment
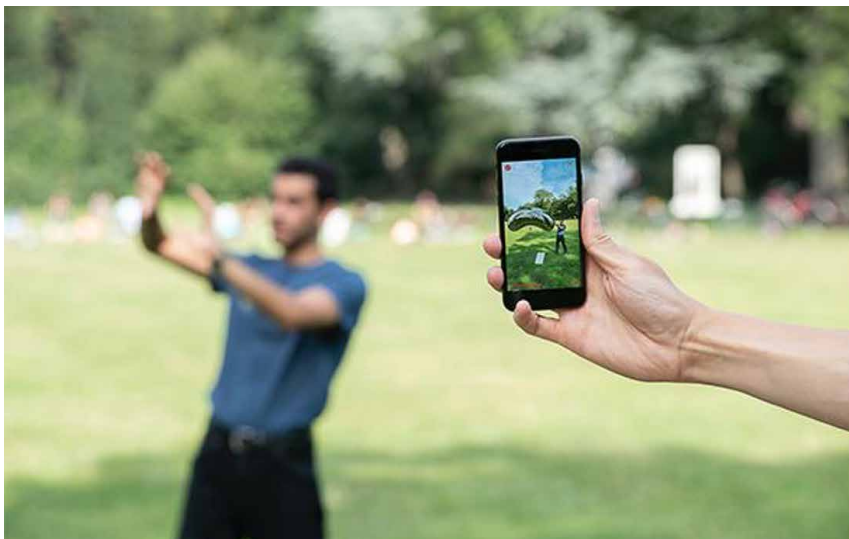

Fig. 1. Jeremy Bailey, *YOUar, stainless steel ellipsoidal arc,* 2021, Augmented Reality App, at Düsseldorf AR-Biennal, 2021, photograph by Katja Illner, courtesy of the Artist and NRW-Forum Düsseldorf.

or replacing it in interaction. Therefore, these image actions can be described as an anticipation of one's own bodily placement in the image and result in pictorial relations between

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23 With common devices, a screen shot requires two hands, since two remotely located keys have to be pressed simultaneously.

body, virtual object, and space. In doing so, they stand out as self-evident, playful explorations of a boundary sphere and thus emphasize the close connection between a sense of immersion and the user's movements.

Symptomatic of these not directly intended image actions, our hands prove to be a central interface to the (physical and virtual) world in the digital age as well, in which manual grasping is still intertwined with cognitive comprehension.[24] While AR figures can generally be placed anywhere, the palm of the hand seems to offer itself as a particularly appealing stage. Surreal proportions are emphasized in the image; a physical nearness to the virtual figure is suggested; and one's own body, moving forward into the virtual sphere, is immersed in it. Conversely, the hand has no influence on the movements of the figure and cannot change anything in the AR, but rather adapts to it and thus, as a stage-like presentation site, resets itself in its actual ability to act and create.

While these movements are individual amusements of the users, in Jeremy Bailey's video work *Nail Art Museum* (2014) (Fig. 2) the hand becomes a very concrete stage of an AR exhibition. In the exaggerated manner of a DIY YouTube video, Bailey, who remains anonymous, notes a renewed shift in the artistic paradigm of creation. If artists moved into organizational-curatorial roles as early as the 1960s, the turn away from manual creation seems to have been amplified by the digital and transformed into the creation of entire worlds. Bailey's proposal is an AR application that allows everyone to independently curate exhibitions, appropriate existing works, and literally present them on their own fingertips. Through AR, company logos, palm trees, and iconic artworks of every era – from the ancient Venus de Milo to Ai Weiwei's Neolithic vases to Jeff Koon's Balloon Dog – can be assembled on one's own hand. The artworks, themselves in thrall to a consumer culture, are perched on finger-bound museum pedestals. In the role of his extravagant alter ego – the self-proclaimed "famous new

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24 J. Hörisch, *Hände*: 18.

media artist," – Bailey satirizes the self-staging practices of social media, addressing museums and artists who in turn use these networks as exhibition spaces. In doing so, he touches upon the sensitive tension between the *topos* of a democratization of art via its mediatized (over)availability and the question of artistic-creative innovation in times of its medial (re)producibility. Bailey further exacerbates this relationship with the aforementioned oversized AR mirror bean: its unmistakable model is Anish Kapoor's steel sculpture *Cloud Gate* (2004-2006), with which countless tourists pose daily for the perfect snapshot. Its social media usability continues to be effective in Bailey's AR and is even facilitated since the sculpture can even be placed on one's own hand with a click.

Fig. 2. Jeremy Bailey, *Nail Art Museum,* 2014, video Performance and Augmented Reality, still from video, courtesy of the Artist.

The hand as symbiotic contact zone

In contrast to the preceding image acts, in which the hand becomes dissimilar to itself because it functions more as a stage or exhibition space, the AR application *Personal Information Organism. PiO 1.1.* (2019) by Aristarkh Chernyshev, and Rachel Rossin's mixed reality theater *The Maw Of* (2022) focus on the hand in its physical genuineness, namely as a contact zone between humans and technology. At the interface between science fiction,

biotechnology, and speculative art, both works allude to so-called *anthropophilic media*[25] for which their unobtrusiveness and cuddliness toward the body and its everyday routines are particularly characteristic. Affect-sensitive wearables, such as smartwatches, are examples of this. These rely less on the user's activity at the interface but rather measure, collect, and utilize personal body data and mental states in the mode of passivity, such as the oxygen saturation in the blood or an incipient feeling of frustration.[26]

With the AR *PiO 1.1.* (Fig. 3), which can be accessed via QR code on social channels of Instagram or Snapchat, Chernyshev imagines a digital hybrid organism consisting of a genetically modified leech and a smartphone whose natural habitat is the human body. The creature, which nestles tenderly around the wrist, lives on the blood of its user but, in return, takes care of his or her health. It does this by continuously monitoring the user's body, even releasing insulin in the case of a rise in blood sugar. It also proves to be a practical tool for Zoom conferencing. While such symbioses are still speculative, the direct link between our brain and the machine has recently become real. The controversial media mogul Elon Musk and his neurotech company, for example, announced recently that they would be conducting clinical studies on humans with so-called brain-machine interfaces.[27] The fact that Chernyshev's *PiO 1.1.* so far only gets under the skin in its conception allows users to experience a futuristic interaction with a wearable assistance creature that intuitively adapts to the movement of one's own hand. When used, the wrist becomes the contact zone of an imagined symbiosis, transforming at the same time into a control surface with various display

25 Cfr. M. Andreas, D. Kasprowicz, S. Rieger, eds., *Unterwachen und Schlafen: Anthropophile Medien nach dem Interface* (Lüneburg: Meson Press, 2018).
26 For Michael Andreas, Dawid Kasprowicz and Stefan Rieger, this mode of passivity is a central marker for the definition of "antropophilic media," which, in contrast to actively used tools, provoke a reduction of distance, since they operate in a new physical, social, and semantic nearness. Of particular interest is the underlying thesis of a shift from technical-medial surveillance to a surveillance that increasingly eludes perception as such and outwits the users. Cfr. M. Andreas, *Unterwachen*: 19.
27 R. Levy, "Elon Musk Expects Neuralink's Brain Chip to Begin Human Trials in 6 Months," *Reuters* (December 1, 2022), https://www.reuters.com/technology/elon-musk-says-expects-neuralink-begin-human-trials-six-months-2022-12-01/, accessed May 4, 2023.

Fig. 3. Aristarkh Chernyshev, *Personal Information Organism. PiO 1.1.*, 2019, screenshot from Augmented Reality App, courtesy of the Artist.
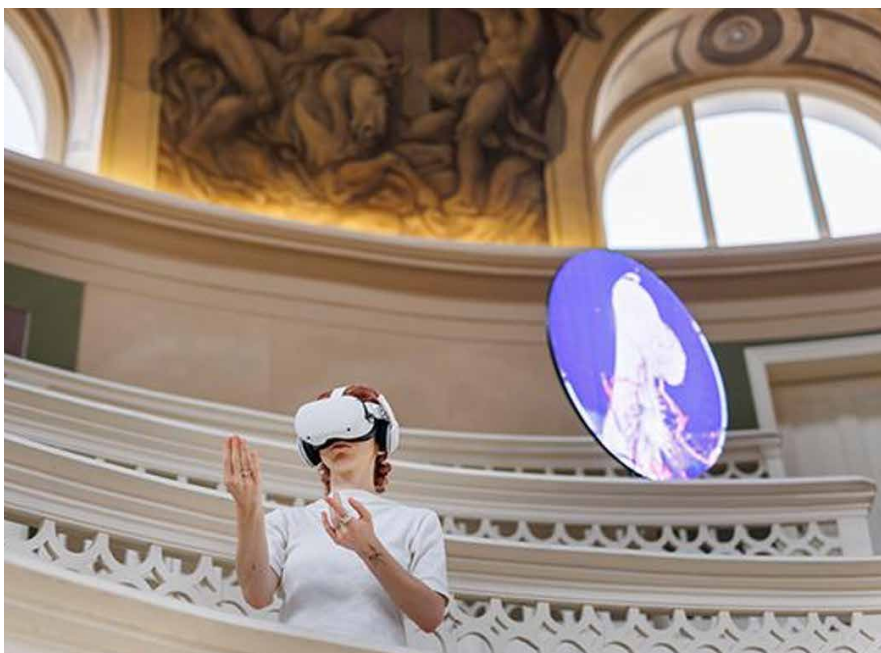

Fig. 4. Rachel Rossin, *The Maw of*, 2022, view of the exhibition "KW on location: Rachel Rossin The Maw of" at Tieranatomisches Theater Berlin, 2022, photograph by Frank Sperling, courtesy of the Artist and KW Institute for Contemporary Art.

modalities and thus suggesting self-control. This collides with the underlying consent of permanent information utilization and must, therefore, be a hollow promise. The quickly transferred consent of a foreign control in assistance systems such as Alexa is closely related to the design of socially compatible counterparts, which is why *PiO's 1.1.* animal-like movements also generate familiarity but thus prompt a self-reflection of the quickly conceded acceptance in dealing with the artwork.

Rachel Rossin's multimedia setting *The Maw Of* (Fig. 4) not only combines various media formats (installation, VR and AR, video, and net art) that blur the boundaries between the virtual and physical worlds as well as technological and organic systems, but also the bodies that inhabit them. Rossin's work is decidedly based on recent research experiments that fuse body, mind, and technology. These experiments are no longer about developing prosthetic extensions of the human body but rather about an invasive fusion of hardware and the nervous system, by means of which our thought center can act beyond the body. The central storyline is a narrative interwoven through the media formats and accompanied by a manga figure, in which the visitors themselves are conceived, as agents of a larger techno-organic network. They follow the figure as a machine spirit through a widely ramified network that embodies the human nervous system. When visiting the work at the Tieranatomisches Theater in Berlin (Sept.14th–Oct. 22nd 2022), the application on an HMD enabled a view (Fig. 5) into the symbiotic sphere Rossin transmedially designed. In the midst of a lush grassy hill environment, which is revealed by a superimposed progression diagram as genuinely calculated and instantaneously processed, two bluish transparent hands appear. They directly implement the hand's own movements and gestures in the virtual environment by means of Leap Motion. The media-reflexive and at the same time instructive text field, "you are looking for your hands," brings one's own hands into the field of vision. Since they appear uniquely in both spheres, they are a contact zone: in the palms of the hands, text codes
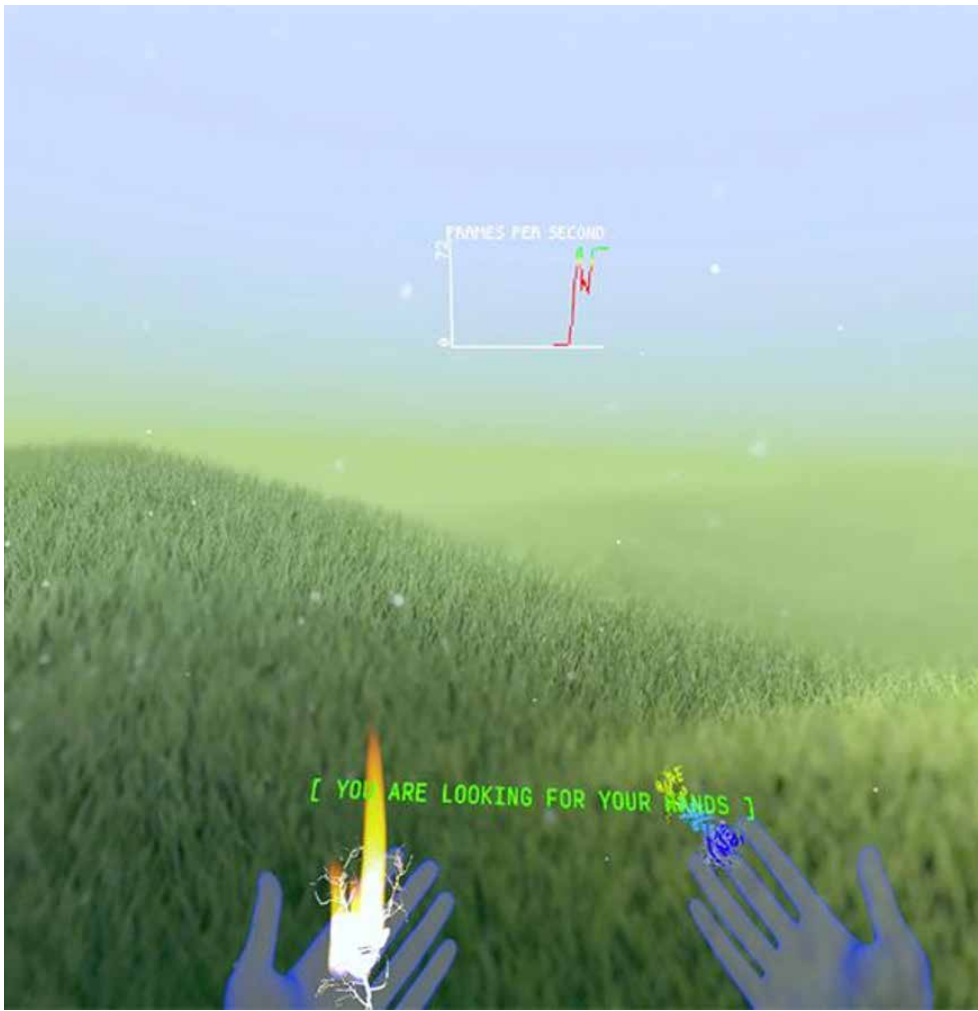
Fig. 5. Rachel Rossin, *The Maw of*, 2022, screenshot from HMD-Experience, courtesy of the Artist.
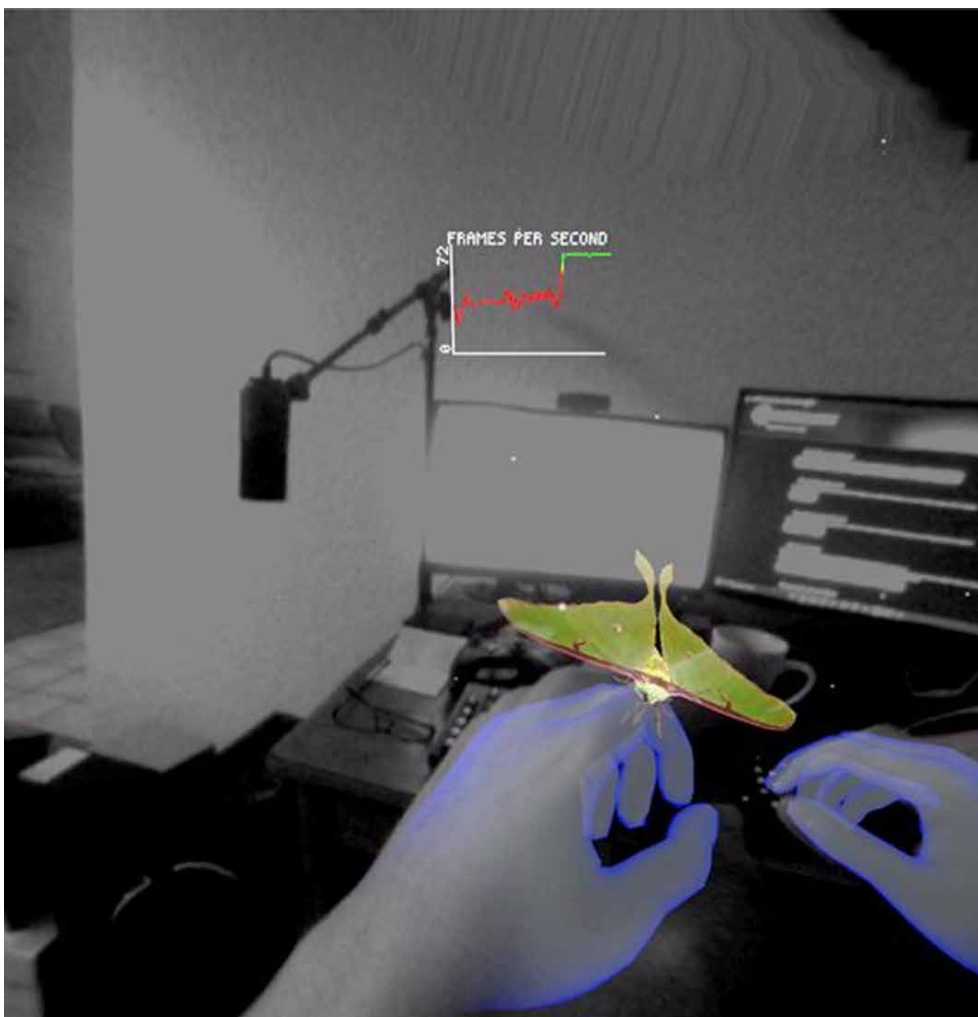

Fig. 6. Rachel Rossin, *The Maw of*, 2022, screenshot from HMD-Experience, courtesy of the Artist.

and symbols alternate with wondrous beings, such as a blazing flame spirit or a human-shaped nervous system. This idiosyncratic interplay continues even as the virtual environment recedes and users find themselves in their physical, but colorless, world with the same virtual figures (Fig. 6). In this superimposed mode of perception, also called "pass-through," the user's own hands intersect with the represented hands, blurring the boundaries between an action in physical and virtual space – for example, when a virtual moth settled on the hand can be shaken off – and paradoxically leading to a disembodiment as well as a sensitization of the user's own corporeality.

The designing hand

While the focus so far has been on the active hand, which has been integrated into the art works as a stage or contact zone, the perspective of the designing hand will be examined in conclusion using the example of Florian Meisenberg's VR installation *Pre-Alpha Courtyard Games (raindrops on my cheek)* (2017). As a collaborative project between Meisenberg and programmer Jan Ahrens, *Pre-Alpha* connects installable, sculptural, and painterly elements with VR, video, and design processes. In the exhibition, visitors are greeted by a carpet drawn up in the manner of an infinity cove used for photography. On its left side, a vertical second-screen projection gives outsiders a glimpse into the intimate VR sphere. By putting on the HMD in the midst of the virtual environment with its rudimentary cosmic world reference, users can model their own virtual objects with pattern-like hand representations, almost like God-like creators (Fig 7). For this purpose, a grid shape shoots up from the underground onto the image surface, which goes back to the basic geometric shapes of 3D programs, so-called graphic primitives, with which illusionistic VR worlds are "built." Even though the hands do not feel any resistance in reality, the shape can be bent and distorted in all directions by lightly touching it in accordance with physical laws, thus referring to artistic

modeling processes. In the next step, the naked grid can be clothed with texturing material. This derives from the artist's own image archive, from which individual images with a textile texture randomly rise up, fluttering in front of the user's hands. In addition to Meisenberg's physically existent paintings, this archive contains all kinds of image material – from antique portrait busts to net-genuine memes to online head texture maps – that are made available to the users for designing the grid surface. Quite literally, an action with images is invoked in this way. The specific gesture of two palms raised in front of the HMD causes the appearance of those double-sided images that can be
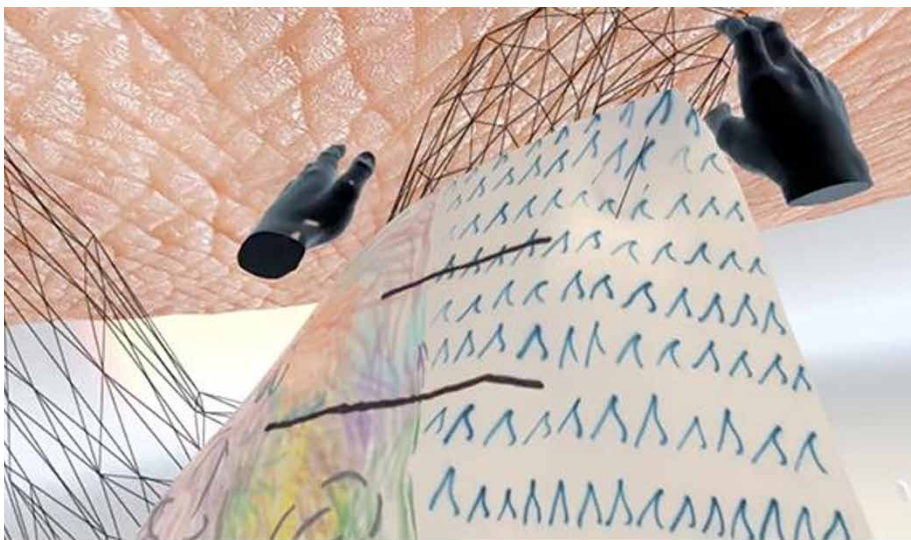

Fig. 7. Florian Meisenberg, *Pre-Alpha Courtyard Games (raindrops on my cheek),* 2017, screenshot from HMD-Experience, courtesy of the Artist.

manually applied to the grid shape.

While such creation processes delegated to museum visitors may have a special visual value for visitors outside the VR, this process is withdrawn in *Pre-Alpha*. While the second screen usually provides a voyeuristic live insight into the processes within VR, in this case it merely shows the pantomime-like hand movements of the immersed user around an empty center. The VR-internally designed virtual object remains intimate, eludes a view, and meanwhile shifts the focus to the manual performance of the (non-) creating hands of the immersed user. In this way, the user on the stage-like carpet becomes an exposed

performer and twists the exhibition logic inherent in the exhibition space.

Along the provisional spectrum of the three forms of action in and with images in AR and VR artworks presented here, the aim was to clarify the extent to which a loss of distance achieved by hand does not primarily subscribe to a technological euphoria or an affirmative immersive experience, but rather offers the recipient the opportunity for reflection in the sounding out of those border zones between the physical and virtual spheres, one's own body and other bodies. With the focus on the hand, it becomes apparent to what extent immersion, in the sense of getting inside a direct contact or a design, grants the potential of becoming aware of and critically sensitizing oneself to those technologies that permeate our lives. Immersion as a productive extension does not exclude emergence – as exemplified by the hand. For whoever puts on the VR goggles must also take them off again, willy-nilly.

AN-ICONOLOGY
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