The Image in Interaction and Proprioception

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The image role in interactive and biosensorial artwork leads back to the term of animism. In that understanding, images of objects and beings are connected with physical objects and beings. We encounter attempts of animistic connection of images and objects in interactive artworks, images become alive. My argument is that in these artworks the rationalistic image-object and even viewer-artwork distinction is erased, moreover: the viewer becomes an image, the artwork. We can follow experiments in multimedia, telecommunication art, interactive art, and biofeedback art and see a gradual disappearance of the breach between the viewer and the image. This is a paradigmatically a new situation in art history where there is no distinction between viewer and the artwork.

Keywords: animism, image, haptic visuality, interactive art, biofeedback art, proprioception.

Interpreted from an animistic and magical worldview, there is a unity between the image and its object whereby the image is a part of the object or being from which it is taken. The image and its object thus belong to the same territory, and the image represents the whole – *pars pro toto*. According to the animistic worldview, it's not only humans and animals that are living spiritual beings but also the whole of the natural environment such as trees, rocks, water, thunder, or cult objects. Furthermore, many traditional animistic and magical cultures describe situations where actions applied to an image also affect the object or being that image represents.

Nineteenth century anthropologists, including Sir Edward Burnett Tylor (1832-1917), who first defined our concept of animism, were certain that animism was the first phase of religion and so belonged to primitive humans. Today animism is more often understood in terms of "relational anthropology"[1], whereby it is a practice of cognition involved in human adaptation to the environment. On this interpretation, animism is essentially based in humans' contact with their surroundings so that humans cannot be detached from nature: the sentient person and the object of cognition or experience constitute an inseparable "we-ness" to which all beings belong.

From an animistic point of view, our cognition and perception of our surroundings are always a form of conversation. This is in stark contrast to the modernistic, rationalist view that requires detachment from the object of our experience. Nurit Bird-David writes that the animistic attitude embraces difference and is opposed to the discrete individuality of "I think, therefore I am." Instead, from the animist viewpoint, we have, "I relate, therefore I am" as well as "I know when I relate."[2]

It follows that the relational experience of animistic humans is essentially practical: the character of objects and phenomena is saturated with unpredictability, and so only attentive and conversational relationships with phenomena can enable us to understand them. Traces of this animistic worldview remain present throughout modern culture. For example, we ascribe personalities to the unreliable or unpredictable behavior of mechanisms such as a car or computer, describing them as "moody" or

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1   Nurit Bird-David, "Animism" Revisited. Personhood, Environment, and Relational Episte-
       mology", *Current Anthropology*, vol. 40, Supplement (February 1999),
       https://www.journals.uchicago.edu/doi/pdf/10.1086/200061.
2   Ibid.

"temperamental" when they break down, crash, or otherwise fail to function properly. When a technological object appears to behave irrationality, it can seem almost alive.

This world of objects in conversational relationships also concerns objects and beings which are separated in space. Oliver Grau writes that the idea of leaving the body and being present somewhere else is qualitatively not a new idea: "Any prehistory of attempts to achieve presence in distant places (that is, telepresence) cannot circumvent the status of images. Let us recall that, before the 'invention of art,' the image was understood as invested with occult powers, which connected us to remote objects and beings."[3] Grau also writes about the distant power of the mirror: seers and clairvoyants were believed to be able to see events in distant locations or far in the future with the aid of mirrors, and sick people were supposed to cover the mirror in their home so that their souls would not take flight through the glass to another existence.[4] In this way, a mirror could be a door or window to escape to another world and the distant power of the mirror image, the sending and receiving of it, is a form of travel or projection. Thus, the power of the image to influence distant objects is, qualitatively, a very old idea.

The use of images in religions and occult practices and the use of primitive technologies for sending of images from one place to another deserve special attention. These basic attitudes can be understood as syncretistic; they are a union of different practices, beliefs, and art forms that are based on understanding the world as a spiritual universe. And if it sometimes seems that all of this is an anachronism, that it belongs to the distant past of humankind, then we should remember that it is still present in the pre-cultural layers of the mind. In the words of a contemporary researcher on visual culture, W.J.T. Mitchell: "I believe that magical attitudes toward images are just as powerful in the modern world as they were in so-called ages of faith."[5]

When the travelers and colonizers of the nineteenth century first came into contact with the native tribes of distant lands, their portable technology – books, photographs, film projectors and gramophones – were

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3   Oliver Grau, *Virtual Art. From Illusion to Immersion* (MIT Press, MA, Cambridge, 2002), 279.

4   Grau, *Virtual Art. From Illusion to Immersion*, 280.

5   William J. T. Mitchell, *What Do Pictures Want?* (The University of Chicago Press, 2005), 8.

thought by those tribes to be wonders and superpowers. The travelers shared the power of their technology by photographing the natives, as did Scotsman Joseph Thomson in East Africa in 1883 – the tribes people called him a "medicine man." As the goal of missionaries was to distribute their religion among the native peoples, the conception of superpowers that they sought to propagate was power with practical purpose, its usefulness being more persuasive than a more abstract, purely spiritual idea.[6] Later, in the twentieth century, the importance of photographic technology as a "soul-stealing machine" declined, and it became perceived as an ordinary technology for documenting and controlling identities.[7]

Heike Behrend has written about practices of witchcraft in Kenya in the 1950s. A photo of an enemy was brought to a witch who then cut it into pieces in order to influence and weaken the victim. Later, photos were made with the Bible also in hand, which we might think incompatible with a witchcraft ritual, but this incongruity makes the competition of different media apparent: in this case, the Bible was intended to have more power in the ritual. Furthermore, there is the story of Mary Akatsa, who established an independent Christian church and who in the 1980s was healing with photos, influencing sick persons *in absentia* by the use of their image.[8]

From the Middle Ages through to the twentieth century, there has also existed a culture of edible images. They were called *Schluckbildchen* – images for swallowing, for healing from fever or other diseases. In Uganda in the 1990s, images were soaked in water and used for healing purposes.[9]

I am interested in how this magical and animistic worldview continues to be materialized by contemporary technologies and to what extent the image and the object are tied together with the aid of technology in different forms of digital art.

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6   Heike Behrend, "Photo Magic: Photographs in Practices of Healing and Harming in East Africa", *Journal of Religion in Africa*, vol. 33, Fasc. 2, Religion and the Media (May, 2003), 129–145.
7   Ibid.
8   Ibid.
9   Ibid.

The connectivity of images and objects in digital art: a new paradigm for art and its viewers

In the following, I will examine the use of the abovementioned image-object relationship in the context of interactive artworks. We should distinguish the notion of a *picture* in the particularity of its object-based sense from the *image*, which can be carried on various media, although there is some overlap between these notions. Whereas the picture is the carrier of the image, as with a painting, drawing, or photograph, contemporary technologies enable the image to be carried by a medium that is not specifically objectified: an image can be projected directly to the eye, as happens with virtual reality devices. We also encounter situations in digital artworks where the image is materialized as an object or picture and is then later manipulated by the user's behavior or body movement. I will also consider interactive and multimedia artworks that are designed for static and photographic images.

Finally, I consider the situation where the image and the user exchange places: the image and the artwork that carries it look back at the user. Although that last sentence may appear to reflect a kind of animistic worldview, I do not intend to suggest that images and pictures are somehow elevated to life and flesh, but that we can see situations where: (1) the positions of the viewer and image are complementary – the viewer perceives that the work "looks back"; and (2) the artwork has sensors that enable it to observe the viewer/participant. This latter way of seeing involves the use of sensor technologies that may be targeted at various information – visual, auditive, or electric, for example, and the input, which originates from the viewer and is combined with the physical entity of the artwork, may alter the whole installation. Regarding the situation in interactive art where an artwork "senses" the viewer, I would like to ask: Should we talk about a completely new paradigm for art and its viewers?

Interactive documentaries based on photography

The image on the screen can also be used to offer the viewer a choice of different content. This is exemplified by two student graduation works in

which photographic material became a source for interactive documentary: Alis Mäesalu's "8 Études About Rooms" (2003) and Kristo Rihm's "Who Lives in the Closet?" (2003). Both projects could be described as database documentaries. In both Rihm's and Mäesalu's projects we see hotspots or clickable buttons arranged in rows on the screen.

In Rihm's project the interactive hotspots are identical to the various box sections, which each correspond to the personality of a particular students. On clicking onto a box section an audio recording of the owner/personality speaking is played. The user can also magnify a particular box so that the image becomes larger, and further clicks on the objects in the box provide additional audio recordings and stories.

For her project, Mäesalu interviewed eight people and asked them to describe their experience of space. Among them are a teacher, an astronomer, and a blind person.

Georg Legrady's "Slippery Traces" (1996), is a photography-based work and a classic of interactive art, which Legrady describes as a multilinear visual narrative. The source material for the work is 240 postcards organized into 24 categories. Legrady divided the material into three interconnected sections. First are the commercial postcards selected from around two thousand and chosen to represent the twentieth century. The second layer is Legready's assessments of these images, entered as keywords. The third layer is autobiographical and includes family portraits from the 1920s and 1940s printed onto postcards and images of places the artist himself visited.

The artist has stated that the project was initially inspired by a two-channel installation in which he had been researching the interrelationships between images in a double presentation. Those images were perceived in relation to other images, whereby the meaning of each is expanded, adjusted, and altered by another, oppositional and/or complementary images. Transferring these images from the physical box into the computer environment liberated them from those limited interrelations, resulting in a new neural network of images that extends to 2,000 in total and allowing new associations to evolve with every chosen click of the user. By relying

1. Alis Mäesalu "8 Études About Rooms" (2003) (screenshot)

2. Kristo Rihm "Who Lives in the Closet?" (2003) (screenshot)

3. Georg Legrady "Slippery Traces" (1996), http://www.georgelegrady.com

on their personal "perceptual filter", the user weaves a new network that is saved to the program.[10]

In the 1990s the user interface became a field for innovation among new media artists. In Legrady's project, red rectangles are displayed around parts of the image on screen, locating the hotspots for interaction. This multimedia "button", hotspot, or area over which to hover the mouse is the starting point for the following discussion of interface aesthetics. In this particular example, the "mouseover" instruction is switched on so that the border of each rectangle is highlighted in color as the mouse pointing passes over it. This is a cliché of user-friendly interface design that creates an expectation in the user that the button aesthetic is communicating its readiness for use. Legrady reformulates this routine: the user should discover and find these hotspots themselves. As compensation for looking at this nonlinear work, each user has an entirely different experience, and the individual linear traces of the visual experience are left in the operative memory of the computer.

Several similar multimedia projects based on photographic material should also be mentioned in this context, including Sally Pryor's portrait of the town of Tunis in her "Postcard From Tunis" (1997) and Russet Lederman's project "NYC Thought Pictures: Memories of Place" (1999) based on the visuality of New York. The activation points and hotspots in these works are subtle. In Pryor's work, the cursor is changed on the image, and the user hears the pronunciation of an Arabic word or the voice of a person shown in the image. The images speak and are brought to life by this interaction, and we can recognize in this the presence of animistic content: the images become more transparent to the people they represent. They are subjects and their "life" can be switched on or off.

The quality of these projects is expressed to a large degree in the design of the user interface, a field of design in which artists competed passionately. Chris Hales's "Tallinn People's Orchestra" (1998) and Mari Soppela's "Family Files" (1998) are most remarkable in that respect. Hales's work is a witty commentary on a day trip from Helsinki to Tallinn. From the point of view of multimedia design, the work was minimalistic and simple: images

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10   George Legrady, "Slippery Traces: The Postcard Trail", in *Artintact 3, Artist' Interactive CD-ROMagazine* (ZKM/Center for Art and Media Karlsruhe, Cantz Verlag, 1996), 103.

of pedestrians as moving images were embedded into the interface and users had the possibility to switch them off, to delete them. In that sense the function of the interaction was paradoxical: not to reveal something and to make possible, but to erase and make invisible. Mari Soppela's "Family Files" is a multimedia of home movies. The screen is divided into nine squares, and clicking on them the user sees sensitive stories in the beautiful Finnish landscape where family members are taking boat trips and picking blueberries.

Unfortunately, the software for authoring this kind of multimedia is now almost obsolete since virtual reality has become the primary medium for interactive narrative that is more immersive but less poetic, or so it seems to me. In contrast, multimedia software gave users the animistic experience of clicking the beings or objects on the screen, prompting their images to move and produce sound so that they become living and responsive.

The image as control console

We can talk about images as instruments from the beginning of their use. Maps, plans, schemes, diagrams, visual instructions, and rational and helpful images have a long history in the practice of steering processes of people in the real space: in battlefields, in architecture, or in dance practice. Normally, there is a temporal delay and spatial distance between the image and its application in real actions. In talking about contemporary tele-images, we should keep in mind that even traditional images functioned over distance.

Lev Manovich has described two forms of telepresence that are characterized by the position and distance of the viewer or how the viewer is positioned through "teleaction": (1) synthetic computer-generated environments (referred to as "virtual reality") and (2) remote, real, physical locations via a live video image.[11] Oliver Grau has further described three kinds of places in which the viewer is thus located: 1) a space defined by the physical position of the body, 2) a simulated visual environment enabled by virtual reality technology, and 3) a relocation via teleaction and mediated by technology such as a robot that is manipulated by the viewer and which gives feedback.[12]

11   Lev Manovich, *The Language of New Media* (Cambridge: The MIT Press, 2001), 165.
12   Oliver Grau, *Virtual Art. From Illusion to Immersion* (Cambridge: MIT Press, 2002), 285.

In describing this form "teleaction", Manovich uses the term image-instruments, thereby retaining its historical ancestry in the image tradition, but these teletechnological environment images can also influence the remote environments they represent. Websites that show web cameras pointed toward roads, buildings, landscapes, or other objects are now commonplace online, but those images are often essentially static – the viewer cannot interfere with the reality they see. However, interactive sites have become less complicated to create, and so otherwise static images may give hints for users that there are means to extend the operator' influence over the location in the image: the camera could be moved, or it may even be possible to switch on processes that will influence or alter the space in the remote location. Only a couple of decades ago, the idea of remote interaction with distant locations was a futuristic proposition only realized by the most costly and advanced technology such as the remote cameras and submarines used in deep diving, but today our smartphones are equipped with software that can enable us to remotely control the heating in our homes, watch security cameras, and switch lights and electronic devices on or off. The vast potential of this technology is now being explored and exploited by artists.

Vera Tolazzi's and Mathias Gartner's installation "The Transparency Of Randomness" (2021), presented at Ars Electronica's exhibition CyberArts, was comprised of an installation of 27 illuminated boxes that dealt with the visualization of chance-based and stochastic processes.[13] The viewer/participant of the artwork could use their mobile phone to visit a website that enabled a pair of dice to be thrown by remote control. The dice and technology were all located within the same installation space as the viewer, so that the participating viewer could see the result of their remote interaction immediately before them. The simplicity and immediacy of the installation provided a clear demonstration that remote operation no longer requires miraculous advanced technology or vast computing power.

Whereas the mobile interface of the above example was schematic, showing the options for manipulation by a simple arrangement of arrows, a far more intuitive connection with the image and the object was provided in Masaki Fujihata's important work "Light on the Net" 25 years earlier

13   Vera Tolazzi and Mathias Gartner, "The Transparency Of Randomness",
      https://www.veratolazzi.com/tor.
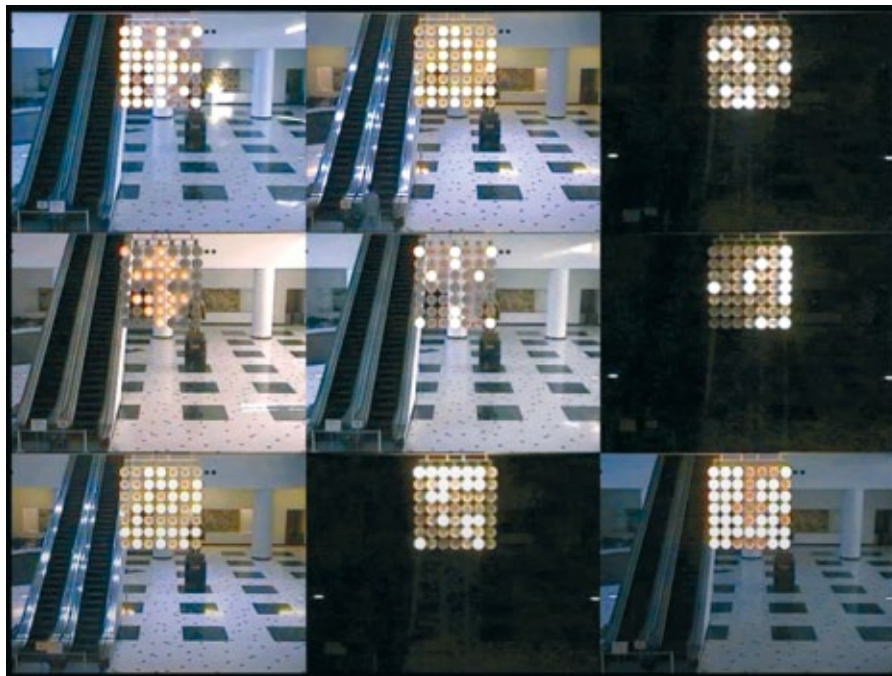
4. Masaki Fujihata "Light on the Net" (1996),
https://www.youtube.com/watch?v=4Lj_VtfZa5E

(1996). Sadly, the work is not currently available, but it offers a clear example of how the image can be used to provide an intuitive interface with a physical object. The image shows a chandelier-like arrangement of 49 lamps that were hanging in a vertical 7 x 7 array in the lobby of Gifu Softopia Centre, near Tokyo. By interacting with the image on a website, the user could switch the physical lamps on and off remotely – each lamp or bulb in the image of the 7 x 7 array corresponding to one of the lamps in the lobby.

Unlike other schemes where interaction with a map or scheme enabled the user to influence a physical object, albeit with a perceptible temporal delay, in Fujihata's work the connection between image and faraway reality is experienced as direct and immediate – the delay is imperceptible to the user despite the various necessary technical elements that sit between the image and the physical object.

The Fujihata example is an artistic project that interrelates the image and object in an essentially playful way. However, in more dryly rational spheres of human life, such as industrial production or military weapons, the aesthetics of the user interface are more directly connected with the physical processes or mechanisms in a more functional way. For designers, the interface presents a challenge: the essentially functional schematic of the mechanism or process must be signified in an intuitive, ergonomic, and easily interpreted interface using images, icons, or some other symbol. In this sphere there is no room for experimentation in the finished design because the remote control of the object must be organized and presented in an essentially rational, functional, and easily interpretable way in order to mitigate, if not entirely avoid, any possibility of costly mistakes by the user.

While the above examples illustrate a remote visual relationship between the objects and the image, and we might imagine that this would have seemed like science fiction at the time, we should note that HTML standards were already in use in the 1990s. HTML made it possible to assign links to slices of images and create interactive hotspots, thereby enabling the whole image to act as a control panel for remote activity on sites or for remote interaction with objects. In this way, the use of images for manipulation of remote reality was already well-established over many years ago.

Touch mediated by the image

The next logical step in the development of image-object interaction is to tie the image with another sensory modality: the change in "another place" is not visual, but auditory or tactile. The idea of sensing the touch of something that is distant from a person's body may belong to the sphere of the fabulous or magical, but it has been always present in the human imagination. Letters or erotic phone conversations between lovers, materializing desire through a form of distant communication in which touch remains always present, albeit latent, and is made sensorial by the intensity of a wish to caress the other and be intimate with the distant body. There have always been technologies for keeping the presence of loved ones tangible: a lock of hair encased in an amulet, the name of a sweetheart tattooed on the body, or

holding an object belonging to the loved one. Jewelry given by a sweetheart is perhaps the most common symbol intended to give a tangible representation of immediate presence, although this may also be bound up with its signification of a kind of property.

Needless to say, today the communication of touch is no longer limited to fantasy but is being explored in practical, technical applications where engineers, programmers, and material scientists aim to create new forms of user interface for sensitive remote action and interaction with remote locations that cannot be made immediately accessible to humans. In comparison to hearing and vision, the specificity and complexity of touch is in the subtly and intimacy of the sensory experience that makes it extremely difficult to replicate through technical means. For example, with vision we may find it sufficient to refresh a signal at least 30 times per second, while for touch this would be 1,000 times or more.[14]

Touch and tactility has received widespread attention in art historical texts and has a long history through to the present day in works such as Alois Riegl's "Spätrömische Kunstindustrie" (1901), works by Adolf Hildebrand, and more recently in those by Laura U. Marks, who writes about "haptic visuality" in relation to video images.[15] Haptic visuality should be contrasted with vision, being more widely concerned with evoking associations with tactile sensation rather than attempting a one-to-one representation of the object as is more typical of visual imagery. Haptic visuality may simply employ material with an unusual or coarse surface that prompts an unconscious desire to touch. Erkki Huhtamo has dedicated an article to the history of tactile art that focuses particularly on interactive art.[16]

In the following discussion, I consider examples where the image is concerned with touch even where the possibility of touch is mediated by a mouse click.

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14   A. Fisch, C. Mavroidis, Y. Bar-Cohen, and J. Melli-Huber. CHAPTER 4: "Haptic Devices for Virtual Reality, Telepresence and Human-Assistive Robotics", in *Biologically Inspired Intelligent Robots*, eds. Yoseph Bar-Cohen; Cynthia Breazeal (SPIE Publications, 2003), 4–4.

15   Laura U. Marks, *Touch. Sensuous Theory and Multisensory Media* (Minneapolis and London: University of Minnesota Press, 2002).

16   E. Huhtamo, "Twin-Touch-Test-Redux: Media Archaeological Approach to Art, Interactivity and Tactility", *MediaArtHistories*, ed. Oliver Grau (MIT Press 2007), 71–101.

Remote touch can be illustrated by the infamous work by Stahl Stenslie called "CyberSM" (1993), in which participants communicated through erotic-haptic suits connected via a computer interface that displayed the torso area. By clicking on the torso display, an electric and pneumatic mechanism was activated, causing the suit of the other participant to produce a tactile and erotic sensation. Although the project became famous and was unique in being focused on erotic sensation, there has hardly been a boom in the growth of tactile/tangible projects since. The CyberSM project may be regarded as sketching out the potential sphere for future developments, such as enabling a grandparent to caress the head of a grandchild many miles away (perhaps while isolated for health reasons?) or for lovers to communicate erotically when living far apart.

Although the emotional motivation for future technologies to be applied in the spheres of love and intimacy must be compelling, their practical use has tended instead to be for violent applications. Here we can recall the Gulf War of 1991 and other offensives where missiles and bombs mounted with cameras flew towards their targets, and casual spectators could watch recordings from the cameras showing the flight of the missile as the target object grew to fill the screen. For the controlling hand behind the camera screen, the destruction was happening far away, and the camera image masked the actual destruction and death brought by the missile's eventual impact. Thus, the immateriality of the image lent itself to brutality.

Military technology has become far more advanced since that first Gulf War – drone strikes can be guided remotely by operators in air-conditioned offices located far away – it has even become a subject of popular movies. This appears typical of the innovation cycle for many new technologies: first, it is used in the military, in space exploration, or in motor racing, and therefore from the outset has no connection to warmth and tenderness but is instead mechanistically functional, efficient, and often brutal in its intent. Equipment that could advance interpersonal understanding over distances is instead often exploited for projecting power or for financial gain. Naturally, it is only state government institutions, vast corporate organizations, and the mega-rich that are capable of supplying the resources

necessary to explore and develop these new technologies.

While these examples illustrate the use of imaginative and haptic technology for remote actions, their underlying concept and quality has ancient origins deep in the human psyche, in the desire to influence processes and project personal power across distant time and space. The essential quality of image and object, and of the action of one influencing the other, remain the same. It is as if deep in the human imagination the image and object must be connected through a virtual channel of influence.

There are, however, a number of artworks that experiment with remote touch, including Stelarc's performance "Ping Body" (1995), which took place at a Telepolis event "Fractal Flesh" presented in the Pompidou Centre in Paris. Participants in "Ping Body" were given the opportunity to utilize the artist's body remotely via their computer terminals located in Helsinki (Medialab of Design University) as well as at the international conference in Amsterdam. The artist himself was in Luxembourg at the time, and his body was attached to various mechanisms that could manipulate his limbs on receiving an input via computer. Again, the viewer participants were able to control Stelarc's body through an image interface that gave feedback of the actual actions being performed by Stelarc's roboticized body. As the artist wrote, it was "cyber-voodoo" and a "displacing of motions" that relinquished the body to the puppet masters behind the distant screen.[17] Stelarc was inspired by this experience to talk about the "prosthetic body": the body as an extension of external technological systems that does not belong exclusively to the embodied person, an idea that has since gained increasing attention.

Human bodies have in some ways always acted through the influence of external circumstances. Systems of social and personal obligations, including workplace environments and interpersonal social pressures, place people in the context of rules and unconscious learned behaviors that constrain our ideal notions of free will. In this metaphorical sense, Stelarc's prosthetic body – a body that obeys others rather than the embodied individual – introduces a further significant dimension in relation to telecommunicative technologies. Of course, Stelarc's body was not only influenced

17   Stelarc, "Fractal Flesh", http://www.medienkunstnetz.de/works/fractal-flesh/.

by the symbolics of social culture (education, upbringing, social culture, and disciplinary constraints), but was also influenced by real electric cables through which instructions and orders were sent. Nonetheless, every human is metaphorically "wired" into their social body, and that body's behaviors are "programmed" by culture and society.

Stelarc has produced several other similar installations where he is placed into the center of a wired, roboticized body, receiving electrical impulses from the system and moving spasmodically. In these works, Stelarc is literally unable to control his limbs: his will (the natural electric signals produced by his central nervous system directed by his brain) is unable to resist the greater electrical power of the robotic impulses sent by the remote system.

Artists have often been the visionaries of future innovations and there have been many artistic illustrations of, for example, production managers guiding workers remotely, owning and controlling the worker's gaze. For example, in Charlie Chaplin's movie Modern Times (1936), a factory director appears on a screen for every worker even while they are taking time out to use the toilet, thereby keeping the hero of the movie in a constant state of anxiety: a prescient image of a future surveillance society.

"The WTO's Golden Phallus" (2001), a work by The Yes Men, a duo of performance artists, provides another colorful example. The work was performed at a textile workers conference in Tampere, Finland, where the duo demonstrated a suit for managers: a golden suit with a giant inflatable phallus and a video screen attached to enable remote supervision of workers.[18] The performance was a grotesque satirical critique of contemporary management culture internationally, particularly in relation to the "sweatshop" workplaces of poorer countries where much global manufacturing and service productivity takes place out of sight of consumers in wealthier countries. The golden phallus or "Employee Visualization Appendage" was to enable the manager to see and operate remotely, leaving them with leisure time for healthy activities. In these poorer countries, colonial practices have been replaced by corporative practices that similarly exploit the people and resources of the poorer nations.

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18   The Yes Men, "The WTO's Golden Phallus" (2001), https://theyesmen.org/project/finland.

In contrast, solutions provided by inter-local experimental actions are present in some artworks, including in the 1970s when Kit Galloway and Sherrie Rabinowitz produced the satellite project "A Space With No Geographical Boundaries" (1977).[19] In that project, four performers, two in Maryland and two in California, were all dancing simultaneously, and with the aid of satellite technology were brought together onto a single screen. It is an example of real-time collaboration over distant locations.

The on-screen feedback image as exciter of the proprioceptive sense

Paul Sermon's works in the 1990s are a significant contribution in respect of evoking the proprioceptive sense in the viewer. His solutions were in a completely new technical environment and were again realized with the aid of an expensive internet connection. In Sermon's projects, different locations are brought together on a single screen, but the image and the depicted object are not connected remotely as they were in Stenslie's installation. Instead, touch is performed at the level of the imagery rather than by any direct physical interface. If two participants wish to touch one another remotely, they do so only in so far as the images of their respective bodies combine in a single image on screen and thus appear to touch. In Sermon's legendary "Telematic Dreaming" (1992), beds are placed in two different locations. Each bed is viewed via a camera hanging overhead, and beside each bed are a screen and speakers to transmit sound and images. The participants lie on the distant beds and see one another's bodies projected together onto a single bed on their screen. In this case an interesting phenomenon can be observed in the reactions and behavior of the participants where, even though they are not in the same room, they each react to the combined image as if they feel in contact with the body of the other person shown in the combined image.

I have seen this artwork just once, at an art museum. On that occasion, a small group of high school children was present. They had been divided into two groups – half were in one room, the other half in another room. As the familiar faces of their school friends appeared on the screen, apparently on the same bed, they began to play at punching one another's

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19   Kit Galloway and Sherrie Rabinowitz, "A Space With No Geographical Boundaries" (1977), http://www.ecafe.com/getty/SA/index.html.

bodies with their fists. You can probably imagine the fun they were having, and the raucous laughter, but they also appeared to behave as though they were delivering and receiving punches directly with the other group. In this example it is apparent that that same aforementioned and ancient layer of human psyche was activated by the experience enabling them to engage easily with the image-object. It seems that from the perspective of the deep human psyche the being and the image of that being do indeed belong to the same territory such that the image and the object are not separable.

Sermon's subsequent project, "Telematic Vision" (1993), is similar in that two different groups interact from two separate rooms, but in one room is a large couch where that group of participants is seated in front of a blue screen. The goal is for the two groups to place every participant so that they are seated on that one couch. The significant difference here is the performative collaboration that follows as the two groups (one in the sofa room, the other in a second room) try to succeed in arranging themselves to appear together. The participants in both rooms tend to focus more on their image as it appears on the collaborative screen rather than looking directly at their body as it is located in the actual physical space directly around them. A game of (accidental) and embarrassed eroticism takes place as people who are usually not acquainted with one another in the physical world negotiate the positioning of their bodies and arrangement of limbs. The situation has some similarities with the experience of standing in front of the mirror, but unlike a mirror there is no left-right reflection so that on a person raising their right hand, they will see the image of the right hand on the screen raising too but facing toward their left side on the screen. This makes the coordination difficult, and the participants move clumsily as they try to orient their own body while viewing it on the screen instead of focusing on themselves in the room.

Here we can use the term "proprioception", which is rarely used in connection with interactive art, although I have previously done so in an article about contemporary screen practices.[20]

20   Raivo Kelomees, "Corporeal Cinema: Tactility and Proprioception in Participatory Art", *Bio-creaton and Peace. Proceedings of the 23rd International Symposium on Electronic Arts: ISEA2017 Manizales,* eds. Julian Arango, Andres Burbano, Felipe Londono, and G. Mauricio Mejia (Manizales, Colombia: Universidad de Caldas, 2017), 492–501.

5. Paul Sermon "Telematic Vision" (1993), http://www.paulsermon.org/vision/

"Proprioception", which was first defined by Sir Charles Sherring-toni in 1906, is a person's perception of their own body position. Normally this is an intuitive understanding of the location of the body and body parts in space. It is a kind of sensory system and a form of interoception, but it is difficult to describe in terms of being a "sense." It is certainly an internal

coordination system relying on the nervous system: objectively, the internal network of nerves in limbs and body parts provides information about the position of the body in space to the brain. This usually happens unconsciously throughout a person's physical movement, such as when a person is touching their nose or putting on their shoes.

Sermon's previous project shows a situation requiring participants to actively assemble visual and physical feedback and where the use of a feedback image serves to awakens participants' proprioceptive sense. We can talk about an awakening and activation of this sense in cases where bodily activity is placed in an unfamiliar situation: the participant should focus their attention on the position of their limbs in space in order to find or locate them again and to achieve the tasks presented by the artwork. This situation is similar to learning any new physical work requiring unfamiliar coordination of the body, such as when a person learns to ride a bicycle, skate, dance, swim, or play a musical instrument. Driving a car requires a person to coordinate their perceptual and physical apparatus, which is learnable but is certainly not immediately intuitive for learner drivers.

Several other artworks based on participation and interaction require a combination of self-image and physical self-conduct. They each present new sensorial-physical challenges where the visible image of the participant is required perform bodily movement and in situations where the participant sees him or herself in a different visual environment. Char Davies' famous "Osmose" (1995) presents a situation in which the viewer must manipulate the visual environment with the movement of their body. This is the classical example of how to connect participant movement with the surrounding visual space. To move in space, the viewer must bend their body; to stop, the body must be straightened, and by breathing in or out the viewer can move their view of the visual space up or down. For the latter purpose, sensors are attached to the neck and lumbar spine area, and the chest is embraced by a special jacket. In this way, movement in virtual space is enabled by movement of the body. Davies was inspired to make this work by his experience of underwater diving, where the body moves vertically as the lungs are filled and emptied of air.

Submersion of the self-image into the participant's body

Sermon's project shows a situation in which the participant can manipulate their image by changing their own body position. This situation, in which the viewer is confronted by their own ever-changing image, was already thoroughly played out in the history of video and interactive art, including many works in the 1970s by Peter Weibel, Dan Graham, Bruce Nauman, and Peter Campus that all exploited the viewer feedback image. Typically in these earlier works, the viewer sees the projected image in such a way that everything is happening in a slightly shifted, disorienting way such as a delayed, incomplete, or otherwise inadequate reflection. During that period, the installation that showed an image of the viewer was still a fresh phenomenon, but this changed and a new cycle of works appeared during the 1990s with the arrival of digital imagery and interaction. Unsurprisingly, the pioneering works in this field have received much attention and have therefore been valuable in communicating the work in this field to a wider audience, being both entertaining and endearing with their use of relatively simple pioneering technologies. In this regard we should mention Romy Achituv and Camille Utterback's "Text Rain" (1999), Scott Sona Snibbe's "Deep Walls" (2002), and Tmema's (Golan Levin and Zachary Lieberman) installation "Messa di Voce" (2003). All of these works present the viewer's own image to create an interactive viewer performance in front of the screen. A smaller number of projects such as Chris Milk's "The Treachery of Sanctuary" (2012), provide mythical identification games. In Milk's installation, participants wave their hands, which then appear on-screen as wings, enabling their counterpart image to rise upwards like a bird. The experience is mystical, surreal, and both metaphorically and literally elevating.

Anu Juurak's "The Mirror" (1998) should also be mentioned in the context of surreal games: in this work the viewer sees themselves throughout as viewed from behind.

Several projects utilize the feedback image of the viewer not to emphasize some element of viewer experience, but instead to deny or limit it. In Christian Moeller's "Electronic Mirror" (1993), an LCD screen provides

6. Chris Milk "The Treachery of Sanctuary" (2012) (Photo: Raivo Kelomees)

7. Anu Juurak "Mirror" (1998) (Photo: Anu Juurak)

the viewer with a foggy reflection of themselves. Similarly, in Random International's "Blur Mirror" (2016), the mirror surface comprises hundreds of small mirrors that constantly vibrate to produce a reflection divided into blurry squares.

In each of these works, the behavior of the viewer being confronted by their own image becomes the raw material of the work: the viewer's realization of their own physical presence is activated in such a way that the proprioceptive sense is aroused just as the viewer engages in directing their spatial location on screen, and from this the viewer has a physical experience of their own image.

This kind of image-object-body feedback is also becoming increasingly apparent in more recent biofeedback projects, where the electrical activity of the brain, blood pressure, heartbeat, and the electric conductivity of the skin are used as material for interactive installation. In biosensorial art the viewer and the object/artwork are not separated, there is no essential breach between them, and they exist together. Sean Montgomery's installation "Emergence" (2010), which he calls a "mixed media sculpture" exemplifies this. Here, the viewer lays hands on interface of the installation and through feedback, the viewer's heartbeat becomes synchronized with the visual rhythm and sound environment of the object: the viewer and object thereby become a whole, pulsing in audiovisual togetherness. In these situations, the traditional exhibition situation of viewer and object is transformed – the viewer is no longer distinct from the viewed.

Final remarks

Mainly, I have sought to prove that different formats of interactive art (multimedia, telecommunication interaction, interactive installation, biosensory art) enable the fusion of image and object in the situation of art reception. Here, the same connection is made between the image and the object/being as can be observed in animistic thinking.

Starting with the discussion of animism, in my article I have tried to look deeper than recognized image researchers, especially Horst Bredekamp in his work "Theorie des Bildakts: Frankfurter Adorno-Vorlesungen" (2007).

He has looked at the substitutive image act, situations where the image is directly related to the living, and its tradition in Christian art. He refers to the tableau vivant, the vera icon; he talks about the substitutive image work that occurs when body and image are mutually substituted in religion, natural science, media, law, politics, war, and image looting. Bredekamp's field of research is a well-established field of study for image scientists, which briefly deals with new art forms.

That is why I have observed what happens between the image and the living in interactive art. Here we encounter a similar phenomenon as in animistic practice, the inanimate and the animate are equated. The "liveness" of the image of a multimedia work can be turned on and off. The interactive installation works only with the viewer's activity as the viewer becomes a part of the artwork, and they enter the territory of the "image". The content of some installations is a transformed mirror image of the viewer, which "lives" according to its own rules under the influence of the program. The viewer's self-image then "dives" back into the viewer and affects the ongoing transformation processes of the reciprocal viewer-work. I pointed out how these self-images entered into the viewer, affect their bodily self-awareness, "awaken" the proprioceptive mind, and put bodily coordination and cognition in new challenging situations. In the case of telecommunication art, we saw how beings and objects can be influenced over a distance through an image. A connection is created between the image and the living through physical space. The viewer finds themselves in a completely new situation when they encounter biosensory works of art that use the viewer's biological information. It is no longer possible to separate the work and the viewer, the inanimate and the living. Their commonality is greater than in previous artistic interaction situations. The work and the viewer form a technological-biological unity. The result is an introspective hybrid. The work, the image, contains the viewer, and the viewer's behavior is defined by the changes in the image. And if the image contains the viewer, the image expresses the behavior of the viewer, then we can say that the viewer is the image. This could be called a paradigmatically new situation where there is no distinction between the viewer and the observed, between the viewer and the work of art.

8. Sean Montgomery "Emergence" (2010) (Photo: Sean Montgomery)

Conclusion: a new paradigm for art and the viewer

Interactive art enables the convergence and intertwining of the viewer and the viewed such that the viewer and the object now share the same image and spatial territory. In many examples the object/artwork functions only with the activity of the viewer. Moreover, in biosensorial work the viewer's body signals become themselves the source material that is presented as the artwork. These works present an entirely new paradigm from which to understand the relationship between artwork and viewer. They each serve to break down the traditional distinction between the image and the viewer that speaks of the image as somehow outside of or representational of the viewer. Finally, the viewer experiences the artwork as an extended embodiment of themselves.

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Santrauka

Atvaizdas interakcijoje ir propriocepcijoje

Raivo Kelomeesas

Reikšminiai žodžiai: animizmas, atvaizdas, haptinis vizualumas, interaktyvusis menas, biologinio grįžtamojo ryšio menas, propriocepcija.

Šiame straipsnyje bandžiau atskleisti, kaip skirtingi interaktyviojo meno formatai (multimedijos, telekomunikacinė interakcija, interaktyvioji instaliacija, biosensorinis menas) suvokėjo sąmonėje sulieja atvaizdą ir objektą. Tokia pati atvaizdo ir objekto sąjunga aptinkama ir animistiniame mąstyme. Šiame tekste analizuoju animistinį pasaulėvaizdį, pagal kurį pažinimas ir suvokimas yra komunikavimo su aplinka formos. Toks pasaulėvaizdis smarkiai skiriasi nuo modernaus racionalistinio pasaulėvaizdžio, kurio pagrindas yra atstumas nuo suvokiamo objekto. Modernioji sąmonė animizmą suvokia kaip žmonių fundamentalų sąryšį su jų aplinka, neleidžiantį žmonėms gyventi atskirtyje nuo gamtos: čia sąmonė ir jos suvokiamas objektas sudaro neperskiriamą „mes", kurio dalis yra visos būtybės.

Šiame tekste apžvelgiu interaktyviuosius fotografijos technologija paremtus multimedijų projektus, kuriuose atvaizdų animavimas ir sugyvinimas naudojamas kaip jų komunikabilumą suponuojanti technika. Patį atvaizdą traktuoju kaip valdymo pultą, kuriuo valdomi geografiškai nutolę objektai. Panašiai kaip ir animizmo atveju, čia įsteigiama jungtis tarp atvaizdo ir objekto, tad tekste apžvelgiu atvaizdą ir lytėjimą jungiančius projektus. Šiame kontekste analizuojant tarp atvaizdo ir fizinio objekto besiformuojančius ryšius iškyla akivaizdžios paralelės su animistiniu pasaulėvaizdžiu. Be to, tekste aptariu žiūrovo propriocepcijos jutimus „budinančius" meno kūrinius, kurių pagrindas yra paties žiūrovo atvaizdai ar atspindžiai. Meno kūrinyje žiūrovo atvaizdas skatina stebėtoją panirti į save, keičia jo padėties erdvėje suvokimą ir stimuliuoja propriocepciją. Stebėdamas biosensorinius meno kūrinius, kuriems naudojami biologiniai stebėtojo parametrai, žiūrovas staiga pasijunta esąs visiškai naujoje situacijoje. Meno kūrinys ir žiūrovas, o taip pat gyvoji ir negyvoji materija trumpam tampa bendra visuma. Jų bendrumas čia pasireiškia kur kas intensyviau nei ankstesnėse meninės

interakcijos situacijose. Kūrinys ir žiūrovas tampa tikru technobiologiniu vienetu. Tokios konfigūracijos rezultatas yra introspektyvus hibridas. Kūrinys formuoja žiūrovo atvaizdą, o žiūrovo elgesys atitinkamai keičia šio atvaizdo parametrus. Kadangi atvaizdas ima betarpiškai perteikinėti žiūrovo elgesį, galima sakyti, jog žiūrovas tampa savo paties medijuotu atvaizdu. Tai galima suvokti kaip paradigmiškai naują situaciją, kurioje išnyksta skirtis tarp stebėtojo ir stebimo objekto, žiūrovo ir meno kūrinio.