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You are the controller: ubiquitous interfaces and interactive digital media art installations

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Abstract

This paper explores the "invisible" ubiquitous interface, the utopian and dystopian stories told about this technology and the consequent meanings attributed to them. I look at interactive digital media art installations that intervene in these stories, critiquing the claims about technology they make, the relationships they promote and the potential that artistic and collaborative experimentation has for destabilizing and reconfiguring them. My argument is that the word invisible, when applied to the interface in interactive digital media art installations, represents the commodification of human and nonhuman bodies. Commodification also implies a linear process of technology whereby relationships, entities and technological developments are linked together in a pre-determined fashion. In doing this, human behavior and experience is, among other things, reduced to an algorithmic commodity, ultimately creating a single, stable, unified perspective of what the interface is, rather than what it could become.

Keywords

interfaces, ubiquitous computing, interactive digital art, interactivity, new media art, digital art

Tú eres quien controla: interfaces ubicuas e instalaciones artísticas con medios digitales interactivos

Resumen

Este artículo explora la interfaz ubicua «invisible», las historias utópicas y distópicas sobre esta tecnología y los sentidos que en consecuencia se le han atribuido. He revisado las instalaciones de arte de los medios digitales interactivas de las que se habla en estos artículos, realizando una crítica de las afirmaciones que hacen sobre la tecnología, las relaciones que promueven y el potencial que la experimentación artística y colaborativa tiene para desestabilizarlas y reconfigurarlas. Mi argumento es que el mundo invisible, cuando se aplica a la interfaz en instalaciones de arte de los medios digitales interactivas, representa la mercantilización de los cuerpos humanos y no humanos. La mercantilización también implica un proceso lineal de la tecnología en la cual las relaciones, entidades y desarrollos tecnológicos están conectados de una forma predeterminada. Así, el comportamiento humano y la experiencia, entre otras cosas, se ven reducidos a una mercancía algorítmica que acaba creando una perspectiva única, estable y unificada de lo que es una interfaz, en vez de centrarse en lo que podría llegar a ser.

Palabras clave

interfaces, computación ubicua, arte digital interactivo, interactividad, nuevo arte de los medios, digital

This paper explores the use of interfaces in interactive digital art installations, the utopian and dystopian stories told about this technology, the claims they make, the relationships that these claims promote and the potential that artistic and collaborative experimentation has for destabilizing and reconfiguring them. I turn to a recent story being told around our human relationship to technology: ubiquitous computing (ubicomp) and its flourishing, yet fragmented and contradictory image of the “invisible” interface. I extend this discussion through an examination of 21st century iterations of the ubiquitous interface: Microsoft’s Kinect (2009; 2011) and Brian Knepp’s installation *Healing Pool* (2008).

My argument is that the word invisible, when applied to the interface in interactive digital media art installations, represents the commodification of human and nonhuman bodies. Commodification also implies a linear process of technology whereby relationships, entities and technological developments are linked together in a pre-determined fashion. In doing this, human behavior and experience is, among other things, reduced to an algorithmic commodity, ultimately creating a single, stable, unified perspective of what the interface is, rather than what it could become. The ubiquitous interfaces explored in this paper are not new. Most existed, in some form, in interactive digital media art installations prior to Mark Weiser’s (1988-1996) conceptualization of ubicomp. Therefore, I also argue that interactive digital media installations are vitally important spaces to interrogate if one seeks to challenge the hegemony of dominant narratives about the development of technology.

Ubicomp is a “post-desktop” paradigm for Human Computer Interaction (HCI) (Weiser 1991). It refers to the seamless integration of technology into every object, place and body. These technologies are deemed “invisible” because their inner workings, as well as junctures and communications with other entities, are concealed. The invisibility of the interface is explored in this paper with reference to texts on ubicomp, particularly those written by computer scientist Mark Weiser (1988-1996). Weiser’s definition of invisibility has implications for viewer/participant interaction and for interactive digital art installations in general. Furthermore, I use Weiser’s definition of invisibility because, as Lori Emerson points out, Weiser’s theories are responsible for introducing this term into the lexicon of interface design, defining it “as a device’s ability to be simultaneously everywhere yet also unexceptional in how it ideally lacks an identity” (Emerson 2014, 5).

Invisibility, according to Weiser, is the main characteristic that differentiates ubicomp from the personal computer (PC) and other modes of HCI. Invisibility is such a significant characteristic for Weiser that he returns to this point repeatedly throughout his essays on the topic. It is imperative, he argues, to “conceive of a new way of thinking about computers in the world... that takes into account the natural human environment and allows the computers themselves to vanish into the background” (Weiser 1991, 3). In doing this, he suggests that interfaces in ubicomp contexts will become “so unobtrusive we will not even notice our increased ability for informed action” (Weiser 1996). Weiser continues his theorization stating that interfaces

should be analogous to the written word; they should be “an integral, invisible part of the way people live their lives” (Weiser 1991, 3). Thus, ubiquitous interfaces provide a more “natural” type of interaction because they “get out of the way”, allowing the user to focus on other, more important things (*ibid.*). Given the importance Weiser places on invisibility in his essays the majority of the questions I ask will revolve around this concept. Why make interfaces invisible? What relationships, processes and structures is the word invisibility suggestive of? What relationships, processes and information does it conceal or reveal? How does ubicomp, and the claims it makes, change via artistic experimentation in interactive digital media installations, if it does at all?

In order to fully understand these questions and the possible change in thinking artistic experimentation with ubiquitous interfaces may enable it is necessary to explore both what the ubiquitous interface is positioned as *becoming*, as referenced in Weiser’s texts on ubicomp, and how we experience these positionings in interactive digital media installations. I use the word becoming here not merely in the sense of a set of linear cultural and technological changes culminating in the realization of semi-realistic potentialities but more in the sense of what these future positionings may or may not signify (helpfulness, user-friendliness, inaccessibility, erasure) and how they connect to past imaginings of ubicomp.

A ‘Shift’ in Computing

In 1988, Mark Weiser introduced the concept of ubicomp, later on defining it as “the method of enhancing computer use by making many computers available throughout the physical environment” (Weiser 1993, 76). For Weiser, the availability and integration of technology into the physical environment is significant as he believes it will result in a space in which “each person is continually interacting with hundreds of nearby wirelessly interconnected computers” (*ibid.*). The ultimate point of creating ubiquitous environments is twofold. I say twofold because ubicomp, as theorized by Weiser, has two interrelated, yet contradictory goals: one humanist and one technicist. The first goal is humanist as ubicomp is centered on users and their interactions with technology. For example, the point of ubicomp, in Weiser’s words, is to: “create a new kind of relationship of people to computers, one in which the computer would have to take the lead in becoming vastly better at getting out of the way so people could just go about their lives” (Weiser 1993, 75). Here Weiser is advocating for what he believes is a better way of interacting with technology, one that shifts attention away from technology (via the integration of multiple small, unobtrusive, or “invisible” interfaces into environments) and onto the user and their interactions with other humans.

The other goal of ubicomp is technicist. It is technicist in that it is technologically driven and focused on technical knowledge. The point

of ubicomp is “to achieve the most effective kind of technology, that which is essentially invisible to the user” (*ibid.*). In order for ubiquitous systems to become invisible, thus effective, Weiser claims that those designing them need to find “the right balance of features” (*ibid.* 78). This balance must meet the specific “niche” for which the device is being designed. However, the only features that ubicomp devices must include, according to Weiser, are “display size, bandwidth, processing and memory” (*ibid.*). Given this, an artist designing an interface for an interactive digital art installation would not have to consider the aesthetic aspects of the device (what it looked like, how it fit in the gallery space and the installation). They only have to take into consideration the technical requirements: size; bandwidth; processing and memory capabilities.

So, ubicomp, as described in the foundational papers by Weiser, is seemingly focused on our human relationship with technology. Yet, the features and relationships Weiser discusses throughout his texts are mostly instrumental ones. As he writes: “The balance for us emphasizes communication, RAM, multi-media, and expansion ports” (*ibid.*). Furthermore, in order to be effective, these features must be inexpensive and easy to acquire, or “off the shelf” (*ibid.*). Central to ubicomp then is the development of affordable, invisible technology and the different types of interaction and relationships between machines and machines that these devices may bring about. In short, what appears to be humanist, in Weiser’s writings, is actually technicist. I say technicist because the focus of ubicomp is not on what it can do for us, but on the technology itself, and its performance in its environment. I suggest this because Weiser places emphasis on the size, speed, power, performance and affordability of the technology developed, not on the relationships that people have with their machines.

While Weiser acknowledges that this balance of features includes communication, the type of communication he promotes is not human-to-computer or human-to-human. Rather, it is communication between computers and computers (pens, boards, tabs, pads) and the underlying software and hardware (RAM, expansion ports) that enable them to function. In this way, the goals Weiser’s theory of ubicomp is based on are predicated on false divisions between the biological, the technological, and the economic(al). Or, to put it more simply: capital, computers and consumers.

Sarah Kember writes that ubiquitous technologies are based on false divisions in the sense that they “articulate and disarticulate, avow and disavow” the entanglement of life, technology and capital (Kember 2013, 60). Significantly for Kember, the entanglement “of technologies and users” in ubicomp discourses “belies the false divisions that persist through new, social and what is sometimes referred to as cross media” (*ibid.* 58). While directly related to Ambient Intelligence, photography and face recognition technology, the point, for Kember, is that technoscience industries “are taking on the media industries, incorporating them in ways that are utterly asymmetric

and exploiting our agential intra-actions or dynamic relations with technology in order to derive value from them”¹ (*ibid.*). They do this, she writes, in multiple ways: by reviving and repackaging e-commerce strategies (replacing venture capitalists and bankers with “prosumers”), reviving and repackaging previous scientific research into the intersection between life, technology and media (Artificial Life, Artificial Intelligence), and by “making direct claims on the everyday and on social environments constituted by users and intelligent artifacts alike” (*ibid.*).

The direct claims that the technoscience industries are making on the everyday, Kember explains, are often contradictory. They cross already unstable boundaries between the public, the personal and the private, as well as the professional and the amateur, and the human and the nonhuman. They come in different forms, depending on the particular type of discourse, technology and environment they are associated with and the scholars or corporations writing about, designing or promoting them. Some, like discourses around Ambient Intelligence that Kember discusses in her article, are created for specific sectors or audiences and deemed ordinary or helpful, whereas other more interfacial products, like Google Glass or the Apple Watch, are called extraordinary and life changing. While these discourses and devices have their own unique vision and version of media, technology and computing, they all have one thing in common: they all emerge out of research conducted in the realm of ubicomp. Thus, they are, as Kember tells us, “incorporated within the claims and innovations associated with the wider discourse of ubiquitous computing” (*ibid.*). As she writes, “Such claims have come from research in ubiquitous computing and they materialized through new discourses and innovations that, by means of the media and technologies of (everyday) life, seek to change the very meaning of it” (*ibid.* 59). How should we understand the relationship between the future of ubicomp that Weiser predicted and its present state as detailed by theorists like Kember? A good first step in developing this understanding would be to examine the underlying goals of ubicomp. A second good step would be to explore how these goals have changed since Weiser wrote the foundational papers.

One of the main goals of ubicomp is to bring about a “shift” in computing – one that Weiser believes will allow human-to-human interactions to become dominant over individual users’ interactions with personal computers. Thus, it is a shift that suggests a very subtle move on Weiser’s behalf from analyzing the relationship between the biological and the technical as separate towards theorizing the human and technology as entangled entities.

For example, the idea of ubicomp, Weiser writes, first came about via research into “the place of today’s computer in actual activities of everyday life” (Weiser 1993, 76). Citing academic studies into

situated learning in classroom- and office-based settings, people, Weiser states, “primarily work in a world of shared situations and unexamined technological skills. However, the computer today is isolated and isolating from the overall situation and fails to get out of the way of the work” (*ibid.*). According to Weiser, ubicomp will rectify these problems: it will make the computer less isolating and get it out of the way. Accomplishing this goal, he states, is no easy task. It is not a multimedia or interface problem. Nor is it a matter of symmetry – that is making computers more humanlike. Rather, for Weiser the challenge is “drawing computers out of their electronic shells” and better integrating them “into human activities, since humans are of and in the everyday world” (*ibid.* 76; Weiser 1991, 3). In other words, computers are not isolated things or individual entities that pre-exist their relations with humans. Nor are they autonomous agents that act alone. Instead computers are made by humans and exist in the physical world. Therefore, they should invisibly enhance, rather than simulate, or isolate us from the world. In this way, Weiser positions the computer, albeit invisible, as entangled with its human user in the foundational papers of ubicomp.

While advocating for what he believed was a better form of HCI, the relationship between the human and the machine that Weiser’s shift in computing subtly hints at is false. Despite his best efforts, I suggest that Weiser is positioning the relationship between the human and technology, via notions of invisibility, as fixed and static rather than entangled. As such, in his theory the user becomes pliable, rather than open to change. In doing this, Weiser’s theory of ubicomp creates boundaries and separations between the user, ubiquitous technology and other subjects and objects. Like the computer itself, any notion of relation between the human and the machine fades into the background and disappears, only to be replaced, in more recent texts on ubicomp, with the same notions Weiser was advocating against: simulation (of the users’ movements by the machine) and symmetry (between the human and the machine).

Weiser’s proposed shift in computing and its problems raise questions specifically pertaining to ubiquitous interfaces and interactive digital art installations. How does the relationship between the human and the machine detailed above manifest itself in these installations? What vision of the interface do theorizations of ubicomp present and promote? Do interactive installations provide the viewer/participant with any means of intervention into these theorizations? In order to explore these questions, I turn to Microsoft’s Kinect (2009; 2011) and Brian Knepp’s installation *Healing Pool* (2008). I argue that the ubiquitous interface is not just an issue of information becoming an object or a thing, but of the normalization and commodification of individual users and their behaviors. This is because the human is positioned, via theories of ubicomp as the means of interaction,

1. Ambient Intelligence refers to electronic environments that are sensitive and responsive to the presence of people. It is a discourse which Kember refers to in her text as a “hybrid of ubiquitous computing and artificial intelligence” (Kember 2013).

translation and navigation. She *is* the digital interface in these installations, and is consequently described as such in the texts that surround them.

“You are the Controller”

In November 2010, Microsoft revealed a new interface to the general public: the Kinect. Microsoft described the Kinect as a device that “gets everyone off the couch. Moving, laughing and cheering” (Microsoft 2015). The Kinect contains a black-boxed peripheral interface which enables users to interact with computers with their bodies rather than with a hardware-based controller. As Microsoft puts it, the Kinect: “brings games and entertainment to life in extraordinary new ways with no controller required. Simply step in front of the sensor and Kinect recognizes you and responds to your gestures” (*ibid.*). Microsoft celebrates this device as “inspiring”, “extraordinary”, “natural” and “controller-free” (*ibid.*). Most telling, however, throughout their website Microsoft explained that the Kinect “could quite conceivably pave the way for new developments in human/computer interaction” and that it could “transform how people interact with technology” (*ibid.*). This subtle reminder that ubiquitous technology transforms how people interact with technology is echoed in Microsoft’s 2009 concept announcement for Project Natal and their 2011 television ad for Xbox Kinect.

The 2009 concept announcement begins by reminding the viewer that the Kinect is “new” and “controller free”. We then see a teenage boy, walking past a television in his living room. Located on the television is an avatar. The avatar senses the boy’s presence and addresses him by name. The boy stops, turns his attention to the television and begins to play a video game, sans controller. As the boy moves his arms and legs, the avatar does the same (Microsoft 2009). Here Microsoft is positioning the human body, the boy, as the interface. This is because the boy, according to Microsoft, is able to navigate the video game and engage with the visual information presented to him using his body. In case we were not convinced, the words “You Are the Controller” appear on-screen while the boy plays.

Contrary to Microsoft, I argue that the boy is not the interface in this context, rather his on-screen avatar is. This is because, the avatar is acting as a mediator between entities, allowing the boy to navigate, communicate and engage with information. Moreover, the Kinect is not controller free. Although it may seem like the boy is making the on-screen visuals appear, it is the Kinect that makes this happen. The Kinect consists of a series of webcams, microphones, motion sensors and software. This hardware and software has the ability to recognize and process a limited set of verbal and gestural commands that then appear as actions on-screen (*ibid.*). The viewer, however, is never told that this is how the Kinect works. Rather, controller-free, full-body interaction just happens. The video then cycles through all

the fun things users can do with the device, telling the viewer about its new features – specifically the fact that it is controller free.

This is exactly where the obfuscation of information, or as Emerson calls it “the magic”, happens – through the invisible and the everyday (Emerson 2014, 14). The Kinect’s minimalist packaging and marketing rhetoric are crafted to make it look special and enticing, yet accessible and user-friendly. Microsoft does this in the hopes that the user will willingly suspend disbelief and accept the impossible: that they will buy into claims about the naturalness and newness Microsoft purports is occurring, regardless of their actual experience with the Kinect. The user’s suspension of disbelief, Emerson states, is akin to what happens at magic shows (*ibid.*).

The audience attending a magic show, Emerson writes, “wants to be amazed by feats that are seemingly impossible” (*ibid.*). Their amazement, she continues, depends on two interdependent factors: “They must believe that the magician’s assistant is not being sawed in half or that a dove is not actually being turned into a handkerchief, and yet they must remain in the dark (literally and figuratively) about exactly how the trick works” (*ibid.*). The same logic is at work in the Kinect. We want to be amazed by seemingly impossible feats and then actually do the impossible: control technology with a wave of our hand. Our amazement and consequent participation in this feat relies on two interrelated components: we must believe that Microsoft’s claims around HCI are *not* true (and to an extent we do, as we physically hook the Kinect up to a monitor) and we must remain in the dark about how exactly it works, and to an extent we are. Microsoft never explains how the Kinect works to the average user.

The 2011 television ad for the Kinect is essentially the same as the concept announcement with two modifications: the first being an absence of spoken words and limited text (Microsoft 2011). Unlike the 2009 announcement, Microsoft no longer feels the need to convince users that their body is the interface. The user’s body simply *is* the interface. In this way, the user’s body is commodified, packaged up and sold back to them for a price. The commodification of the body is reflected by the fact that the phrase “you are the controller” is no longer repeated. This phrase is now an indisputable fact, something users already know and must accept if they want to use the Kinect.

The second modification concerns notions of creativity – notions that were seemingly non-existent in the 2009 announcement. The 2011 ad features a family putting on a shadow puppet show. They have made a shape of an elephant with their bodies in their living room. This shape is reflected on-screen and then placed on a canvas in a virtual artists’ studio. The family can then get creative. If used correctly, the Kinect offers to turn the family into artists by letting them paint the shape that they created. The family “throws” grey paint on the elephant-like shape and are rewarded for their creativity: their picture is placed in front of a landscape background. The phrase “Work of Art!” is overlaid on top of it (*ibid.*).

This specific part of the 2011 ad is telling as it reveals an inconsistency hidden in Microsoft's humanist claims around the Kinect. Microsoft claims the Kinect is focused on us and our interactions with technology (*ibid.*). The Kinect, according to Microsoft, is a creative device, one that implies active learning and making (*ibid.*). After all, it is the user, not technology that is creative. The Kinect just aids in the creation of an open-ended, participatory and user-centric experience. This claim is reinforced on their website: The Kinect allows you to "unleash your creativity" (*ibid.*). Based on the action occurring in the advertisement, however, creativity with the Kinect has not transformed how people interact with technology, thus enabling users to "unleash their creativity". It does not allow them to produce artistic content. Instead, the type of creativity Microsoft is promoting is a restrictive, two-dimensional version that amounts to little more than the consumption and surface-level manipulation of predetermined content that is exploited by Microsoft, repackaged and then sold back to its users for profit.

Microsoft does this in multiple ways: they do it subtly, by releasing the code as "open-source" and then selling access to the community of makers that they have deemed "creative" back to its users (inaccessibility becomes exclusivity); and they do it blatantly, directing content creators to webpages, via drop-down windows titled "monetize" which provide instructions on how to sell content and placing permanent watermarks on user-generated images (*ibid.*). In this example, Microsoft has not only instrumentalized the user by turning them into an interface ("you are the controller") it has co-opted the term "creativity", and commodified it, turning it into a term that is leveraged to drive profit.

The instrumentalization of the human body and the resulting commodification of aesthetic content raise questions about artistic experimentation: namely artistic experimentation by digital media artists with ubiquitous interfaces in interactive digital art installations. Companies like Microsoft are co-opting experimental ubiquitous interfaces that were developed for interactive digital art installations in the early 1990s for capitalistic purposes. These interfaces have become commercial products and are marketed to users, as "creative" and "natural". While their technical make-up is similar, commercial interfaces differ enormously on practical, creative and theoretical levels from those created for the aforementioned artworks. While not necessarily new, the interfaces created for these artworks were novel – specifically in terms of what the viewer/participant could actually achieve and the type of interaction afforded to them.

For example, the interfaces of the early 1990s were developed and then deployed to combat or attempt to correct, as Simon Penny argues, "the notion of the (computational) virtual and the confused rhetorics of virtuality" attached to technologies like virtual reality and the Internet (Penny 2013, 265). Fueled by the availability of affordable domestic, computational media technologies and the burgeoning rhetoric of cyberculture, the 1990s, Penny writes, saw an "explosion of creative

research in interactive and immersive art" (*ibid.*). Digital media art, he states, thus became "a highly charged vortex" for the development of interfaces "as the traditional commitment to material immediacy and finely crafted sensorial effect abruptly confronted a technology framed as abstract immaterial manipulation of information" (*ibid.*). Therefore, the reconciliation of "the sensibilities of arts practices and the capabilities and constraints of emerging computational media technologies" was, as Penny explains, just as important to digital media artists, if not more important than a technical exploration of technology itself (*ibid.*).

Since then, ubiquitous interfaces that mimic those created for digital art have been developed and sold by commercial entities. However, the computing industries reliance on, in Penny's words: "virtual reality's stock-in-trade tracking and simulation techniques indicates that ubiquitous computing is less the kind of antithesis of virtual reality that Weiser envisaged and more of a continuity" (Penny 2013, 236). Thus, the co-opting and consequent commercialization of experimental ubiquitous interfaces by the computer industry, Penny argues, has had the effect of reintroducing rhetoric surrounding "the virtual" into discussions concerning media and technology (*ibid.*). In doing this, commercial ubiquitous interfaces like the Kinect perpetuate the exact same narratives about the interface that digital artists in the 1990s were attempting to correct, in particular those around about disembodiment.

The disembodiment that this rhetoric promotes remains one of the principal concerns raised by ubiquitous interfaces. More subtle, however, is the role the ubiquitous interface may play in creating, in Katherine Hayles' words, "an animate environment with agential and communicative powers" (Hayles 2013, 503). Hayles continues, arguing that issues that have been raised around the effects ubiquitous technologies may have "are primarily epistemological (who knows what about whom)" (*ibid.*). However, the "political stakes" of these environments, she states, encompass much more, including "the changed perceptions of human subjectivity in relation to a world of objects that are no longer passive and inert" (*ibid.*). Thus, she concludes, the questions raised around ubiquitous technologies are not only confined to epistemological concerns, but envelop ontological issues as well.

For example, the Kinect, as a ubiquitous interface, operates not only in the realm of gaming and computer science as in the sensing, recording and identifying humans, but also in what Hayles, borrowing Nigel Thrift's terminology, calls the "technological unconscious" (*ibid.*, 505). It operates in this way by working in subtle ("you are the controller") and not-so-subtle ways ("the Kinect transforms how people interact with technology") in an attempt to change the relationship between humans, technology and space. Epistemological concerns about ubiquitous interfaces, like surveillance and privacy, Hayles writes, can and are being addressed through strategies and tactics like regulation, informed consent or critique (*ibid.*, 503). Ontological issues,

such as to what extent human subjectivity and bodies are being reconfigured by ubiquitous technologies, are much more difficult to understand and address. Thus, our reaction to them, Hayles argues, mostly exists on the level of resistance (*ibid.*). However, she states, if our reactions to the concerns ubiquitous technologies raise remain solely on the level of resistance, we “lose the opportunity to seize the initiative and explore the technologies potential for shedding the burden of long-held misconceptions about cognition and moving to a more processual, relational and accurate view of embodied human action in complex environments” (Hayles 2013, 503). The challenge that ubicomp presents to us then, is how to use its potential as an interface in positive and constructive ways while still remaining critical of it. Since the context in which this challenge presents itself to us is interactive digital art installations, the question becomes: how might an investigation into the deployment of ubiquitous interfaces in interactive digital art installations help us find different ways of thinking about and using ubiquitous technologies? Digital media artist Brian Knep’s *Healing Pool* (2008) could provide us with one alternative route into addressing the questions raised above.

The Alternative Ubiquitous Interface

Healing Pool is a large-scale digital media art installation consisting of multiple closed-circuit cameras, projectors, computers and a horizontal projection surface, which is located on the floor. The surface is covered with neon yellow, cell-shaped patterns. The patterns are generative, so *Healing Pool* has no evident start or end. Left alone, the patterns slowly pulsate and shift throughout the course of each day. When a viewer/participant walks across the projection surface, the patterns tear apart, revealing a trail of orange spaces or “wounds” (Knep 2008).

Placing an object on the projection surface or standing still produces a similar effect – a gaping hole appears. After a certain period of time, the patterns rebuild or “heal” themselves. The healing process does not restore the patterns to their previous state. It creates “scars” on the surface of the work, which are based on the placement of an object, or the trajectory of the viewer/participant walking across it. The more the viewer/participant interaction builds, the more scars appear, altering the visual appearance of the piece. Since the viewer/participant must walk across the patterns on the floor to reveal the full nature of the artwork, the interface is her body.

It is imperative at this point to address what could be seen as a contradictory designation of the interface. My designation of the viewer/participant’s body as the interface in *Healing Pool* could be said to contradict my earlier argument concerning the designation of the user’s body as the interface in the Kinect. The difference in my designation lies in how the interface is deployed as well as how the relationship between computation, aesthetics and the interface is staged by the artist and performed by the viewer/participant. Should we

make the mistake of confusing the staging of the relationship between computation, aesthetics and the interface *Healing Pool* presents to its users for the one Microsoft presents to theirs (appreciation and consumption of beautiful moving images), we learn that the purpose of *Healing Pool* is to provide a space in which “interactions – among people, between people and the piece, between people and the space they occupy” occur (*ibid.*). Here, Knep’s emphasis is on relationships between entities and the interaction that these relationships create. Just as important to *Healing Pool* as its visual aesthetics, then, is the viewer/participant’s relationship with technology – specifically how her interactions with the interface (her body) can alter, to an extent, the artwork. Rather than trying to erase the interface all together via false notions of invisibility, creativity and control, what is important in *Healing Pool* is the interface – that is, the viewer/participant, her interactions and creative experience within the installation. By placing importance on relationships, Knep is emphasizing the experience and expression of the medium and the interface. He does this by making the alterations to the piece that the viewer/participant creates, visible. Thus, notions of artistic production and creation can begin to shift away from representationalist modes of thinking and cybernetic modes of interacting, to a more performative and experiential exploration of, and reflection on, the potentialities of the interface.

For example, when the viewer/participant walks diagonally across *Healing Pool*’s surface, the patterns split apart. After a certain period of time, the trail knits itself back together, creating visible scars. These scars, Knep states, “form a memory of all the interactions that have occurred” (*ibid.*). *Healing Pool* therefore “becomes a map of movement in space” one that is not only visible to those located in the installation space, but one that they can physically change, to an extent, as well (*ibid.*). Here, *Healing Pool* is doing what the Kinect does not: it enables the viewer/participant to “explore her creativity” by allowing her to become “the controller” of the action occurring in the artwork. It does this by making the effects that the viewer/participant’s embodied interactions have on the artwork visible. By becoming visible, the viewer/participant has the opportunity to begin to critically explore the effects that her interactions may have on the artwork as well as recognize connections between her movements and the movements of others. In short, the emphasis in *Healing Pool* is placed on viewer/participant movement and experience, not on the machine’s response. Since emphasis is placed on the viewer/participant’s experience rather than the end-product of her actions, as it is in the Kinect, viewer/participant interactions in *Healing Pool* become performative artworks themselves. Furthermore, by emphasizing notions of performativity, processuality and visibility, I argue that a space is opened up in *Healing Pool* for viewer/participant intervention via critical reflection – one in which the viewer/participant can think seriously about her experience with the work, the consequences that her alterations have on the patterns’ surface and how these alterations affect the other entities around her.

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