ISEA2015
Proceedings of the 21st International Symposium on Electronic Art
ISSN: 2451-8611
ISBN: 978-1-910172-00-1

# Multiple Bodies in Interactivity. Representations and pathways of the corporeal.

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### Abstract

The present work looks into the place the body occupies within interactive experiences. Firstly, we explore the nature of the machine in its corporeal dimension, and the human body in the digital representation process. Then, a classification is proposed for the modes of articulation of the participant's body in interactivity, following various analytic frameworks. Finally, we analyze the difference between the physical bodies within an experience and the construction of the bodies present in the artwork, outlining the dialogue between technical engineering and the symbolic dimension.

### Keywords

Body – Interactivity – Interfaces – Representations - New Media.

## Introduction

*"An interactive work challenges one to undergo a transformation from an onlooker to an "interactor", an active agent. A peculiar kind of dialogue develops. In addition to mental interaction that is a precondition to the reception of art in general, physical, bodily action –one that involves more than just movement of the eyes-takes place".*

Erkki Huhtamo

Interactive Art shakes the spectatorial tradition, and invites bodies to get up from their exclusively receptive position and assume an active role within the artwork territory.

If we look closely at an interactive work, we will see bodies in motion, exploring, communicating, and relating sensorially to the work. Through direct observation, they will appear as whole bodies. However, there is a difference that often goes unnoticed between the interactor body in the installation space and the body that is integrated into the interactive experience, and through which the public interacts. The physical bodies in the installation space differ from the bodies perceived by the interactive system and the interacting bodies, but still all of them fold and converge into the subject who converses with the artwork.

As Caroline Jones (2005) states, mediations in human sensoriality have greatly intensified.

The physical body of the public who is immersed into the artistic experience shares the space with the mechanical body of the artwork. When they meet, they define a semantic universe which reconfigures the relationship among objects, subjects, and environments.

## The Mechanical Body and its Senses

*"Today, we are transferring what we know about machines into living organisms, and vice versa. For this reason, we sometimes refer to bodies as machines, and to machines—or technical processes in general—as a kind of life (artificial life)."*

Arlindo Machado

Just as the interactor is a kind of mind-body unit, the computing device may be understood as an artificial mind-body configuration. The *hardware-software* pair which makes up chips in action suggests the idea of a physical dimension (*hardware*) and an intangible dimension, similar to mental processes (*software*). Considering the pair as a whole, *hardware* could be thought of as the interactive system body.

In this context, *sensors* in a machine would be equivalent to *senses* in human bodies: bridges between the inside and outside, a means of information exchange, points where receptivity from the outside and exteriorization of internal processes are articulated. The lexical connection between the word *sensor* and the word *sense* points to the underlying analogies regarding the constitution of machine devices. In this sense, *sensors*, like windows to the world, allow the system to *perceive* and establish a relationship with the environment.

The human body may also be thought of as an organic interface. David Rokeby outlines a comparison showing the difference between our body and the interfaces:
*'Our "organic" interface is extraordinarily complex and massively parallel. Our sensing system involves an enormous number of simultaneously active sensors, and we act on the world through an even larger number of individual points of physical contact. In contrast, our artificial interfaces are remarkably narrow and serial…'* (Rokeby: 1990)
Given the diversity in sensors, there are several senses that may be built into the *hardware*. The machine body is, by definition, a polymorphic body. Its senses and thresholds are defined by algorithms, and are subject to processing speeds. The characteristics it assumes in each artwork will, in turn, define what dimensions of reality it will be able to

perceive and which bodies in the audience it will be capable of conversing with.

## The Organic Body and its Representations

*"Far away from the mechanical logic and inserted into the new digital regime, modern bodies act as processing systems for data, codes, encrypted profiles, information banks. Thrown into the pace of technoscience, the human body seems to have lost its classical definition and its analogical integrity; within the digital plane, it becomes permeable, projectable, programmable".*

Paula Sibilia

The physical body of the public in contact with the interactive work turns into another body's framework: the represented, virtualized body; the body that is perceived by the artwork. These two bodies may coincide or differ considerably. The following sections present -using a taxonomic approach- different modes in which the body becomes integrated into interactive works.

### The Body as a Unit

In some artworks, interaction is based on actions from a unified body. Generally, these are works that use movement in space as the variable for interactivity. A work like *«Rain Room»* (2012), by Random International, invites the user to experience a curious situation: walking in the rain without getting wet. In order to achieve this, the heavy rain falling within the room will open special hiatuses at the exact point where the body is located. Bodies circulate and go around the space enabling, as they move, rainless patches that make them waterproof, shielding the skin from humidity. Thus, the body acts as a unit during the experience.

The body is conceived as a unit that stimulates the artwork, and triggers the transformation of the shape.

### The Partial Body

In various interactive works, the body stops being a compact unit, and is reinterpreted and partially incorporated into the artwork. In the same way as, in movie productions, an actor's entire body at the stage is analyzed and visually cut when captured in a close-up, in many interactive works, the body is fragmented, keeping the physical component as a material framework for the interaction, and trimming certain senses, limbs or organs that form part of the interacting body in the artwork. We will establish three main analytical spheres for partial bodies.

#### 1- Senses

*"If the mission of 20th century art was to make the invisible visible, 21st century artists will be concerned with finding ways to allow us to sense the invisible in the visible. The ratio of the senses may shift, and new perceptual modes may be uncovered."*

Roy Ascott

Various artworks build their interactive mechanism based on a particular *sense*.

**A) Sight - Eyes**

One of the emblematic works using this approach is *«Zerseher»* (1991) by Joachim Sauter. In an art gallery setting, the one-time spectator stands before a painting when something unusual occurs: his or her glace starts to deconstruct the image. This work fully addresses the classical issue of spectating as a passive phenomenon, and the interactivity derived from interactive aesthetics.

In this artwork, the main point of contact in the interactive activity is the eye and, more precisely, eye movement.

**B) Hearing - Ear**

Due to its receptive nature, hearing is not a sense that usually generates stimuli for artwork input; nonetheless, it may be observed that, in some works, it plays a main role in terms of the connection between the body and the work. This variety includes the project «*Hot and Cold Whisperer*» (2009) by Ebru Kurbak and Jona Hoier, which emulates children's "hot or cold' game. The interface consists of a headset the user needs to wear. In cities, Wi-Fi signals are an invisible and intangible presence. The headset works as a signal detector. A voice whispers 'hot', 'warm' or 'cold' into the user's ear announcing the proximity of a Wi-Fi signal while the user wanders round the installation space.

**C) Taste - Tongue / Smell - Nose**

Taste—together with smell—is probably one of the least explored senses in interactive works. However, a few examples do exist. We might mention the work entitled «Mate Parlante» ('Talking Mate') (2013) developed in the UNA Multimedia Art course of studies (in Argentina) by Mariano Ferle, Azucena Lozana and Sebastián Caiafa. This work invites the user to sit down and drink mate. A thermos with water allows the user to pour this liquid into the mate containing yerba mate, and acts as the interface. Once the user pours the liquid, he or she can drink it through the straw. With this gesture, while the user drinks, the mate will tell a story related with the tradition of this infusion, exploring a founding ritual for River Plate idiosyncrasy. The artwork content is accessed through the physical action of drinking.

**D) Touch - Skin**

The introduction of the sense of touch is probably the main innovation brought by Interactive Art in terms of the artwork sensorial dimension. As Erkki Huhtamo (2007) states, Interactive Art is bound to the touching action, and this generates important conceptual changes in the field of artistic experience.

The work «*Delicate Boundaries*» (2007) by Chris Sugrue is based on the sense of touch, in several ways. Virtual organisms contained within a screen move into the physical space, travelling on the user's hand, and can go

around his or her upper limbs surface; skin is where the body and the image meet.
In the work *«Touch Me»* (2004) by the Dutch group Blendid, integrated by David Kousemaker and Tim Olden, users must press their body on a frosted glass surface to leave an impression of themselves. Almost emulating a large-scale scanner, participants put themselves against the glass in various manners while a light scans the surface and prints the body; the visual result resembles drawings made in caves 10,000 years ago. A great number of modern interactive works include touch in same way.

## 2. Limbs

Another possible criterion is thinking about the body in terms of its parts or limbs. This classification overlaps with the senses, but, essentially, the purpose of the approach is based on the perspective that some configurations do not seem to be mainly related to the senses, even though they may include them.

**A) Hands**
*«Mobile Feelings»* (2002), a work by Christa Sommerer and Laurent Mignonneau, focuses on the hand as point of interaction. Through a tangible interface, a pumpkin-shaped object, two users can feel the vital parameters (heart rate and breathing) of the other person. As a result, this work generates a non-verbal, bodily and intuitive communication between remote people.
We may even go into more detail and observe some cases where only part of a hand can become the acting body in the artwork. In the work «*Pulse Index*» (2010) by Rafael Lozano Hemmer, a finger is the point of contact between the public and the artwork. The user is invited to introduce a finger into a wall cavity. The interface captures an optical image of the fingerprints, which are projected, amplified, on screens around the exhibition space. At the same time, the interface senses heart rate and prints images at a speed that is analogous to the user's pulse.

**B) Head**
The Australian artist George Khut created «*Wee Leaf*» (2009) within the framework of the residency entitled «*Thinking through the body: Sensorium Gymnasium*», where various artists explored the potentiality of movement, touch and proprioception. In this work, a tree leaf hangs from the ceiling, at a person's head level. This work invites users to stand on a platform capable of sensing body balance, and induces them to touch the leaf with their face and cause movements. The swinging of the leaf in space, and the balancing are translated into sounds, in a situation that proposes an experience for the body that is unusual in interactive works: interaction is mainly achieved through the face; interactive action occurs in the head as a whole.

**C) Vocal Tract**
«*Universal Whistling Machine*» (2004) by Marc Böhlen and JT Rinker addresses the topic of language universality, and resorts to whistling, which is common to all cultures (and several species), as a communication code. Thus, participants face a system that can engage in a dialogue with them. They are invited to whistle, and then that whistle is reproduced by the machine in a sound mimicry act. In this case, as we can see, the *interacting* body is the vocal tract (and the lungs providing air for the whistling sound to be created). In reference to the perceptive thresholds described in previous sections, this work is only sensible to whistling, not to words. That is, if the user pronounces verbal language, the work remains immutable; this action falls outside the perceptive ranges of the work.

## 3. Organs

> *The body and the outside universe have exchanged places; the new adventure is not to discover new lands or planets but to see and map the inside of the body.*
>
> Lev Manovich

The third segmentation is based on the body and its integration through the organs. This category implies traveling beyond the dermis into the body's inner core. Bodies become reversible, folded, to reverse the relationship and put the inside on the edge, in contact with the outside world.

**A) Heart**
We can find a group of artworks using heart rate as interactive action, with a peculiar characteristic: action is usually involuntary. Rafael Lozano Hemmer explores the scope of this approach in a series of works entitled «*Pulse Room*» (2006), «*Pulse Park*» (2008), «*Pulse Spiral*» (2008), and «*Pulse Tank*» (2008). All versions share a common operation: the user pulse rate is translated into light impulses or water movements, in closed or even open spaces.

**B) Lungs**
Works that use breathing or blowing as interactive action connect to lung activity as a contact point with the installation. Scott Snibbe developed his work «*Blow Up*» (2005), where whistling supports the whole experience. An interface composed of a matrix of small coolers waits for the user to activate it. Through blowing, the user makes the micro cooler blades turn. The air pattern is memorized and then replicated in an analogous, larger structure with big coolers. That small gesture is reproduced by strong drafts in the installation space. Other people present in the room can stand before the larger cooler matrix and feel the wind designed by the user, in the analogous interface, on their skin. In this case, the work combines partial modes of interaction/reception.

**C) Brain**
In some works, the measurable phenomenon that drives the evolution of the artwork tangible form is brain activity. In «*Eunoia*» (2013), by Lisa Park, brain waves are read in order to manipulate water movement in containers surrounding the body of the performer, who interacts while

remaining utterly still. Surfaces vibrate, and water forms varying patterns driven by an intangible inner process.
The work «*Neuroknitting*» (2013) by Varvara Guljajeva, Mar Canet, and Sebastián Mealla, provides the user an interface to measure brain activity. The visual representation of waves makes up the knitting pattern of a machine that reproduces the design. When the experience concludes, the user gets a physical weave that reflects inner, mental activity.
In such cases, we find a paradox: bodies interact while seemingly at rest. When looked at from the outside, they do not differ greatly from spectatorial bodies. In fact, considering their eyes remain closed, they seem to be closer to sleep than to wakeful activity. However, there is an ongoing interactive process connecting the inside with the outside.

## Conclusion

Body engineering has come to Art, not always in the form of physical reconfiguration, as expressed boldly in prostheses and foreign body implants. There is a subtler way, though equally impactful on the artistic experience: body design in the artwork, the conception of a body which will be *perceived* by another body (the machine's) and which will be allowed to act under certain circumstances and in particular contexts. *Represented* bodies overlap or run in parallel, and are elevated from the physical level to the symbolic level.
Behind the optical illusion of *whole* bodies in interaction, we may discern the presence of a *symbolic* body, different from the *physical* body within the space of the work, holding metaphors as well as sensations. The body is contained in a double sense: contained by the design limits, and contained as an inherent part of the expressive proposition put forward by the artistic event in which it is inscribed. It is usually assumed that content is beyond the interface, that the interface represents the border between the subject and the content. The changes we are witnessing may be signaling that the time has come to rethink these notions, and realize that the body, in Interactive Art, is incorporated as an expressive resource in the artist's palette, through new media.

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Among her artistic works in collaboration with other artists are included: 'Sentímetro' (2005), 'Heroes' (2010), `MASA' (2014); projects selected in open calls, with the support of institutions such as Espacio Fundación Telefónica de Buenos Aires, Fundación Telefónica de Lima, Museo de Arte de Lima (MALI), Escuelab, Alta Tecnología Andina and Medialab Prado Madrid.
Her works on new media theory have been selected in festivals such as 404 International Festival of Electronic Art (Argentina), FILE10 (Brazil), ISEA2010 (Germany), FILE 2013 (Brazil), RE-NEW Festival (Denmark), ISEA 2014 (Dubai), Computer Art Congress (Brasil), SIGRADI (Uruguay).