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Embodiment and Instrumentality

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ABSTRACT

This paper investigates the relation between embodiment and instrumentality in interactive new media art. It discusses three artworks that encourage embodied interaction within a completely abstract visual and/or auditory system. Whereas David Rokeby's *Very Nervous System* invites visitors to engage with a sound-movement composition by means of embodied performance, Tmema's *Manual Input Workstation* encourages them to manually explore the basic characteristics of sound and form. Sonia Cillari's *Se mi sei vicino*, on the other hand, invites them to reflect on the effects and perceptions of touch and bodily proximity. All three works are not representational in the sense that the visitor contemplates a visual or auditory statement created by the artist. They are rather systems that enable the manipulation of processes that generate ever new outcomes. As such, they might seem comparable to (musical) instruments, but their complexity and unfamiliarity to the users characterise them more as apparatuses. This paper argues that their operators' struggles with apparatusive resistance can be identified as creative exploration, which constitutes the core of the aesthetic experience of interactive art.

Furthermore, the works analysed challenge the dissociating effects of the apparatus by inviting different modes of bodily engagement, from the figurative via the subconscious to the emotional. As opposed to the operation of musical instruments, here the relation of bodily actions, apparatus and audiovisual configurations is not based on physically causal effects, but on settings determined by the artist. The exploration of these settings is characterized by an oscillation between playful immersion and moments of distanced reflection, guiding the aesthetic experience of the work.

Categories and Subject Descriptors

J.5 [Arts and Humanities]: Arts, fine and performing

General Terms

Performance, Experimentation, Theory

Keywords

interactive new media art, instrument, apparatus, embodiment, aesthetic experience

1. INTERACTIVE ART AS INSTRUMENT?

Commonly a work of art is argued to be an individually created or selected configuration, presented to mediate an idea or motivate

reflection. Many works of interactive new media art, though, are not (re)presentational in the sense that the visitor contemplates a visual or auditory statement offered by the artist. They are rather systems that allow for the individual exploration, selection or organisation of pre-produced situations or material, or they enable the manipulation of processes that generate ever new multimodal outcomes. As such, especially the latter might be better described as instruments. Generally, instruments are considered devices that are a means to an end, providing an enhanced efficiency of our sensory organs and/or locomotory system. Nevertheless, we also speak of musical instruments – devices that do not aim to enhance efficiency, but rather are for 'worldmaking' [5: 225, 226]. By applying this notion originally coined by Nelson Goodman, Krämer refers to the creation of artificial worlds and new experiential possibilities, which would not be possible without the respective device. These instruments therefore do not serve for processing material for practical purposes, but for creating symbolic or abstract presentations that challenge our perception.

Also many works of interactive new media art offer systems for 'worldmaking', but unlike musical instruments, their perceptible output is not restricted to audio; they may include visual, tactile, and sometimes even olfactory information. We could thus tentatively describe them as 'multimodal' or 'artistic' instruments. But there are further pertinent differences between musical instruments and interactive artworks.

2. INTERACTIVE ART AS APPARATUS

Musical instruments rely on basic physical or mechanical effects directly related to the operator's bodily actions. The manual operation of chords, keys or finger holes that produce or manipulate vibrations (of strings or air) establishes an immediate relation between player and instrument. The musician deploys technical skills to produce sound in accordance with the special characteristics of the instrument. The instrument presents a challenge to the player that can be sensed as physical resistance. This resistance is identified by Aden Evens [2] as the creative potential of the instrument.

Interactive new media art works, however, are usually based on digital technologies.¹ Their electronic and code-based processes, distributed across hardware and software, impede an immediate,

¹ This is also true for electronic musical instruments, but for the same reason, these also differ ontologically from the classical musical instrument.

physically causal relation between input and output. Due to their complex and physically dissociated nature, it might be more suitable to describe such works as apparatuses. Though the notion of the apparatus is anything but well defined, we tend to imagine it as an intricate system of mechanical, electrical or digital processes. Like the instrument, the apparatus may serve to enhance efficiency and may also be used for ‘worldmaking’ (like the photographic camera), but it is generally understood to be far more complex. Due to this complexity, Vilem Flusser describes the apparatus as a black box. He argues that operators of an apparatus play a game, “for which they cannot be competent” [3: 26]. Though the general characterisation of apparatuses as black boxes is disputable, especially if they rely on standardised technology, definitely most interactive artworks are well described by this notion, as the user is not familiar with their functionality.

As a matter of course, any apparatus (like any medium and any instrument) not only enhances productivity or creative potential, but at the same time limits or channels them. Flusser [3: 25] therefore argues that the operator does not play with, but against the apparatus: “He crawls into the apparatus to reveal the tricks hidden within it.” An apparatus may thus be operated by embracing its offer for ‘worldmaking’, but also by pushing its boundaries.

Accordingly, like the musical instrument, the apparatus is based on resistance. However, if this resistance is judged as productive in the case of musical instruments, it is often criticized as an imbalance of power relations in the case of the apparatus. The reason is that the resistance of musical instruments is based on physical laws and can be met by physical abilities and skills, whereas the resistance of the apparatus is due to programmed processes, which are based on and to be met by intellectual reasoning. Exponents of apparatus theory as well as critics of interactive new media art hold that the person setting up the apparatus, specifically the artist, exercises control over the users, programming opaque systems allowing only for a restricted number of operative options. The users are bound to tediously explore the functionality of the apparatus, while never being able to adapt it. As will be argued in the following, however, it is exactly this act of exploration that constitutes the core of the aesthetic experience of interactive art. Within interactive art, aesthetics, understood as the enhanced, conscious perceptive cognition enabled especially through artistic statements, is focused on the process of interaction itself, not on the output the latter may generate. By operating the system, the user is encouraged to reflect upon its processes and the underlying assumptions. This process may be centred around mental decisions executed through customised symbolic interfaces. There are artworks, however, that re-introduce physical factors into the interaction process, thus making exploration an embodied experience. In the following, three case studies will serve to investigate the extent to which this fact affects the ontological status and aesthetic potential of such works, especially considering the specific modes of resistance identified for the instrument on the one hand, the apparatus on the other.

3. TMEMA: MANUAL INPUT WORKSTATION

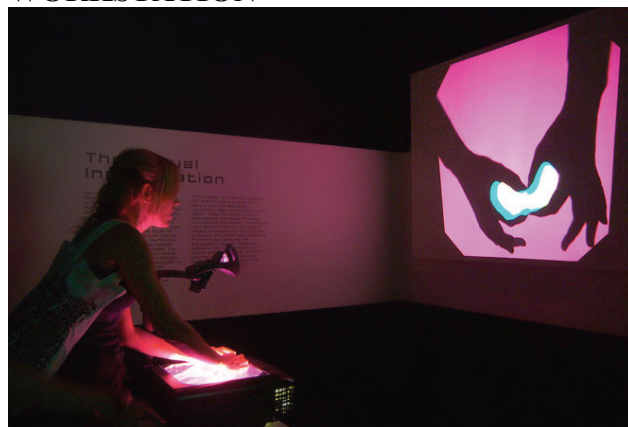


Figure 1. Tmema: Manual Input Workstation

At first sight, Tmemas *Manual Input Workstation* (2004), an interactive installation for the manipulation of forms and sound, resembles an ordinary overhead projector with plastic shapes offering themselves to be positioned on the glass surface. The shapes are not simply projected, however. The projected image is simultaneously recorded by a video camera attached to the ceiling, and then transformed, animated, and superimposed via data projection onto the overhead projection. The visitors soon realize that it is possible to interact with the apparatus using more than just the shapes provided. Gestures made with their own hands offer other, more sophisticated ways of creating shapes in a kind of shadow play.

Different programming modes enable different types of sound and form production. The NegDrop mode invites the creation of closed contours to generate negative spaces that the system then fills with colored positive shapes. When the contour is broken, the positive shape drops to the lower boundary of the projection, where it bounces repeatedly, each time triggering a sound that varies according to the size, form, and fall velocity of the shape. The InnerStamp mode immediately sonifies the shapes created by the participant and allows the sound to be constantly modified by altering the shapes.

The possibility of directly manipulating these sound-producing objects allows for a precise control of the interplay between shape, position and sound. The factors that contribute to the generation of a tone – volume, pitch, and timbre – are directly assigned to the basic characteristics of shapes – volume, contours, and position – and thus to the manual operations. The artists themselves highlight the novelty of this system “in which the hands are used to simultaneously perform both visual shadow play and instrumental music sound.” [6: 115]

The manual operation has an important impact on the interaction process, as the latter is not based on semantics or symbols (as in custom computer interfaces), but on figurations. The visitors do not command, select, or state something, they invent figurations based on shadow play. But although they manually operate the system, there is no causal physical relation between their gestures and the forms and sounds they trigger; the relation is exclusively based on programmed settings – the position of the form could just as well be mapped to the pitch as to the timbre of the sound.

The system visually interprets the gestures and sonifies them, but the gestures do not physically generate the animations projected via data projector and the sounds played. Nevertheless, the animations imitate physical properties and relations, acting as though a form were squeezed by a hand, as though it drops due to its weight or makes a sound while bouncing. This may induce visitors to believe the impression that they are directly creating the audiovisual results with their gestures, ignoring the mediating apparatus, but they are also encouraged to reflect on the arbitrariness of the mapping processes, especially through the different programming modes offered.

4. FROM CREATIVE EXPLORATION TO MASTERY

Dieter Mersch [7: 80] identifies imagination and (re)figuration as the two basic parameters of artistic creativity. Either artists draw on their free powers of imagination as an inexhaustible source of ever new images and ideas, or they refigure and recombine them, turning them into entirely new configurations. We could argue that Tmema leave parts of the figuration to the visitor, based on a figurational apparatus imagined and realized by the artist. But we could as well argue that it is the visitor who initially creates the shapes through their gestures, which are then interpreted and refigured by the artistic apparatus. It is exactly the mutual validity of both descriptions, originating in the apparative character of the work, that constitutes the act of experiencing this work. The process of exploring the potential of the system answers the creative act of the artist. The shadow play of the visitors is thus not primarily to be addressed as creation, but as creative exploration, as they explore the functionality of the system and adapt their input to understand the algorithms that guide the mapping process. The more they come to understand this process, though, the more the visitors are able to productively counter the resistance of the apparatus and start to use it as a production device.

The ability to counter the resistance of the musical instrument is addressed as virtuosity. It is demonstrated by and judged through the publicly performed piece, requiring a foregoing phase of training. Furthermore, virtuosity not only denotes the ability of the musician to meet the resistance of the instrument, but also to rise to the challenge presented by the score. It is only in improvisation that a musical structure is invented or altered in the very moment of its performance.

The experience or realisation of interactive new media art is also not usually based on a score or other kinds of instructions. But whereas an improvising musician is still familiar with the instrument, the operator of the interactive apparatus is not, and prior practicing is not expected. As the visitors to the work have no insight into its functionality, let alone any experience in operating it, the work has to be intuitive to enable interaction at all. Golan Levin and Zachary Lieberman (acting as Tmema) emphasize the importance of a combination of simplicity and complexity for a satisfying interaction of participant and audiovisual system: “*the system’s basic principles of operation are easy to deduce and self-revealing; at the same time, sophisticated expressions are possible, and true mastery requires the investment of practice*” [6: 115]. They advocate a mix of repeatability and inexhaustibility, the latter resulting from the system’s sensibility to “*minuscule differences in user performance.*” Hence the structure of the system enables a rich

experience from the beginning, as the visitor can intuitively interact, explore its functionality on several levels of detail and obtain immediate, visual and acoustic feedback in the form of an audiovisual composition clearly related to their actions.

On the other hand, Levin and Liebermann consider virtuosity to be possible in operating their system. As they have proved within several highly appraised performances, the artists themselves – having programmed the system – can of course act as virtuoso performers², but they predicate this mastery also for others.

However, once the system is operated with mastery – by the artists or by any operator that has invested enough time and practice – its ontological status changes. As long as the aesthetic experience centres around the interactive system and its exploration, the system itself can be considered the artwork, but once aesthetic considerations centre around the output or result produced by means of the system, the latter becomes purely instrumental, while the resulting audiovisual configuration can be contemplated as an artwork in its own right.

5. DAVID ROKEBY: VERY NERVOUS SYSTEM



Figure 2. David Rokeby: Very Nervous System

In the 1980s, Canadian media artist David Rokeby created a complex system for physical, spatial interaction between human motion and sounds, the interactive environment *Very Nervous System* (1986-1990). The movements of a person are recorded by a video camera, analyzed by motion tracking computer software, and then responded to by sequences of sounds that simultaneously induce new movements. During the process, the software registers individual body parts in movement, but also the direction, speed, and rhythm of the motion. The resulting sounds imitate the voices of different instruments, but also reproduce everyday noises such as human breathing and rippling water.³ Rokeby describes each instrument that can be motion-activated as a behaviour—an electronic personality that observes the participant and accordingly chooses its own actions. Thus, for example, an instrument might tend to go off beat or change the rhythm when

² Actually, they even created a performance version of the system first, presenting it as *Manual Input Sessions*, while later producing the installation version as *Manual Input Workstation*.

³ Rokeby created various compositions or algorithms of sound.

the participant increases movement speed. [9] The artist points out that his interest in interactivity is not focused on straightforward and logically comprehensible control of processes. He is more interested in challenging the image of the computer as a logical machine detached from the body by creating a system based on intuitive bodily actions. His concern is mutual resonance. [8]

Whereas Tmema hold interaction as intentional creation, based on exploration and successive intellectual understanding, Rokeby objects to an interpretation of interaction as control. He is not interested in a clearly explainable, intellectually understandable control of processes. He wants to challenge the idea of the computer as a logical, body-unfriendly apparatus through a system that is based on intuitive bodily reactions. His use of the term resonance points to the fact that the actions of the participants may even be unconscious. According to Rokeby [8], if the visitors “*allow themselves to respond spontaneously to the music of the system, it is they who are played by the installation [...] allowing the music of the system to speak back through one’s body directly, involving a minimum of mental reflection*”. Of course, also here the visitor may learn how to ‘correspond’ with the system, how to trigger certain sequences. But unlike Tmema, Rokeby does not aim for mastery, but rather interplay. Whereas in the *Manual Input Workstation*, the gestures serve to intentionally create figures, the *Very Nervous System* invites bodily movement to encourage the allowance of the flow of the subconscious in favor of reasoning and mental control.

The works of both Tmema and Rokeby do not use custom computer interfaces, but demand bodily engagement. The manual gestures shape sounds and forms, the bodily movements interchange with musical sequences. The direct use of the human body at first seems to eliminate any mediating level between input and output. Nevertheless the bodily engagement is not at all immediate; instead of physical resistance it is subject to an apparative transformation. Instead of countering forces, the bodily movements influence immaterial shapes and sounds, based on a programmed mapping. While playfully exploring these artificial interdependencies – in an intentional figurative act or as an unconscious, emotional reaction – participants are encouraged to reflect on the relations of gestures, forms and sounds established by the artist, as well as on the role and effect of their own embodied actions within the interactive system.

6. INTERACTION AS AESTHETIC EXPERIENCE

“*I am an interactive artist. I create experiences.*” [8: 27] Rokeby’s famous statement exemplifies the attitude of most interactive artists, who emphasise the activity over the result, addressing the interaction process as their primary interest. If the artwork is grounded in the experience, an analysis of its aesthetics also has to focus on the experiential process. Here again, a comparison with making music may facilitate a closer analysis of this process. Although in musical performances the focus of aesthetic considerations is traditionally on the result (the performed piece), the act of playing itself has also been addressed as an aesthetic experience. Psychologist Mihaly Csikszentmihalyi [1] analyses making music as an example of activities based on intrinsic motivation. Starting from the question of why people find satisfaction in activities that are not goal oriented, he coined the term ‘flow’ to describe the joy of being active itself.

But a joyful or satisfying experience is not the same as an aesthetic experience. As a basic condition for aesthetic experience, aesthetical distance is considered essential. As Hans Robert Jauss [4: 83] explains, the aesthetical object is constituted only through the contemplative act of the beholder. This poses a conflict between the deep involvement of exploration within interaction processes and the need for distance that enables aesthetic reflection. For Csikszentmihalyi, flow excludes a simultaneous reflection on one’s own action. He nevertheless observes regular interruptions of the state of flow, created by moments of reflection: “*Typically, a person can maintain merged awareness with his or her actions for only short periods, which are broken by interludes when he adopts an outside perspective.*” [1: 38] Aesthetic experience is thus possible within the interaction process as long as it encourages an oscillation between absentminded activity and reflection on the latter. Though the possibilities for this are manifold, in works like those just presented, which focus on audiovisual systems, multimodality is of key importance: The interrelationship between visual, acoustic and gestural information is artificially constructed by the artist, and often based on reciprocal analysis and reflection. The exploration of these settings demands an enhanced perceptive attitude and thus enables the necessary distance for a conscious aesthetic experience. The extent to which visitors actually realise this process is, of course, subject to each one’s individual attitude and openness for exploration and experience. Also, especially in works like Rokeby’s, if the user actually experiences the moments of mutual resonance Rokeby aims for, the reflective moments may even happen after the actual experience – nevertheless they are still encouraged by the system itself.

7. SONIA CILLARI: SE MI SEI VICINO

Sonia Cillari’s work *Se mi sei vicino* (2006) (If you are close to me) uses a human performer as interface. The female performer stands on a black tarp in the middle of a dark room with projection screens on two walls, showing abstract graphics in motion. The visitor is invited to step onto the tarp, with a white square marking the location of the performer. As soon as the visitor approaches the performer, a composition of spherical, metallic and very low sounds starts to play. At the same time the graphics – a vibrant three-dimensional grid arranged around a vertical axis – start to extend horizontally in the direction of the visitor and to build cusps. Touching the performer effects a strong intensification of movement and sound, the grid is filled with patches changing from grey to coloured. The performer, however, remains utterly passive – like a puppet, in contrast to the graphics, which turn out to be visualisations of the electromagnetic field emanating from her. Performer and visitor stand on a sensor floor made by a grid of electromagnetic radio frequency proximity sensor plates tracking electromagnetic signals and foot position. The sensor system captures the energy interference between the human bodies, taking the performer as transmitter and the visitors as receivers.

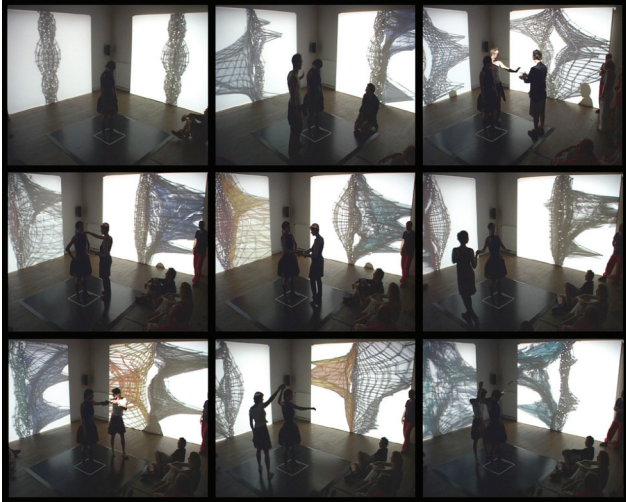


Figure 3. Sonia Cillari: *Se mi sei vicino*

This time we can actually ascertain a physical effect of the visitor's actions, though again it is visualised on a symbolic level. The physical effect, however, is not based on force, but on electromagnetics and thus operates at the threshold between the material and the immaterial. Cillari emphasises that by measuring and visualising not only touch but also proximity, she wanted to show that "*the boundaries of self extend beyond our skin*". Also, the visitors' actions do not trigger forms or sound directly, they interact with another human, who becomes communication partner and interface at the same time. Cillari describes the performer as a "*human antenna*"⁴. Like Rokeby, she does not aim for intentional figurative acts on the part of the visitors, but for an emotional reaction and consecutive reflection of the visualisations and sonifications they trigger. She alludes to the bodily reaction to interpersonal encounters and motivates reflection by causing emotional irritations (due to the ambivalent role of the performer as human and interface) and by suggesting a visualisation and sonification of emotions and bodily reactions.

8. CONCLUSION: CREATIVE EXPLORATION AND APPARATIVE RESISTANCE

All three of the works analysed here challenge the dissociating effects of the apparatus by demanding bodily actions of the visitor. While they do not rely on physically causal effects, they nevertheless invite different grades of physical engagement, from the figurative via the subconscious to the emotional. The interaction is based on exploration, configured around manual operation, bodily resonance or interhuman communication. This exploration is at the core of the aesthetic experience of the works, based on the oscillation between playful immersion and moments of reflection. A key factor within this process is the apparative resistance, which has been shown to be closely related to the multimodality of the works considered. A more general condition for this resistance is the newness or originality of the apparatus. The instrumental condition of the musical instrument follows a

well-known standard, as do traditional apparatuses, such as the photographic camera. This standardisation is the pre-condition for their commercial use and for the establishment of standardised instructions or notation systems. The more familiar the users are with the functionality of the apparatus, the less attention they devote to them – their attention shifts to the realised outcome. Works of interactive new media art, on the other hand, are unique and unfamiliar and therefore not transparent in the way instruments are. This makes the exploration of their potential and a reflection of one's own exposure to it a rich aesthetic experience in its own right.

If their functionality is gradually revealed, however, this automatically leads to a reduction of the reflective moments. Aesthetic considerations then start to centre around the output or result produced by means of the system, which is then judged as a Gestalt that can be contemplated as an artwork in its own right, while the system is reduced to an instrumental production device.

9. REFERENCES

- [1] Csikszentmihalyi, M. 1982. *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play*, San Francisco: Jossey-Bass.
- [2] Evens, A. 2005. *Sound Ideas. Music, Machines, and Experience*. Minneapolis: University of Minnesota Press.
- [3] Flusser, V. 1989. *Für eine Philosophie der Fotografie*, Göttingen: European Photography.
- [4] Jauss, H. R. 1991. *Ästhetische Erfahrung und literarische Hermeneutik*, Frankfurt: Suhrkamp.
- [5] Krämer, S. 1995. Spielerische Interaktion. Überlegungen zu unserem Umgang mit Instrumenten, in: Florian Rötzer (ed.): *Schöne neue Welt. Auf dem Weg zu einer neuen Spielkultur*, Boer, 225-236.
- [6] Levin, G. and Lieberman, Z. 2005. Sounds from Shapes: Audiovisual Performance with Hand Silhouette Contours in The Manual Input Sessions. In *Proceedings of NIME '05*, Vancouver, Canada, May 26–28, 115-120.
- [7] Mersch, D. 2006. Medialität und Kreativität. Zur Frage künstlerischer Produktivität, In B. Hüppauf, C. Wulf (ed.): *Bild und Einbildungskraft*, Munich: Fink, 79-91.
- [8] Rokeby, D. 1990. *The Harmonics of Interaction*. In *Musicworks 46: Sound and Movement*, <http://homepage.mac.com/davidrokeby/harm.html>.
- [9] Rokeby, D. 1995. Interview with David Rokeby in *wired*, 3.03, <http://www.wired.com/wired/archive/3.03/rokeby.html>.
- [10] Rokeby, D. 1998. *The Construction of Experience: Interface as Content*. In *Digital Illusion. Entertaining the Future with High Technology*, New York: ACM Press, 27-47.

⁴ Website of the artist:
<http://www.soniacillari.net/research.htm>