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Children, guidebooks, SMS and virtual characters

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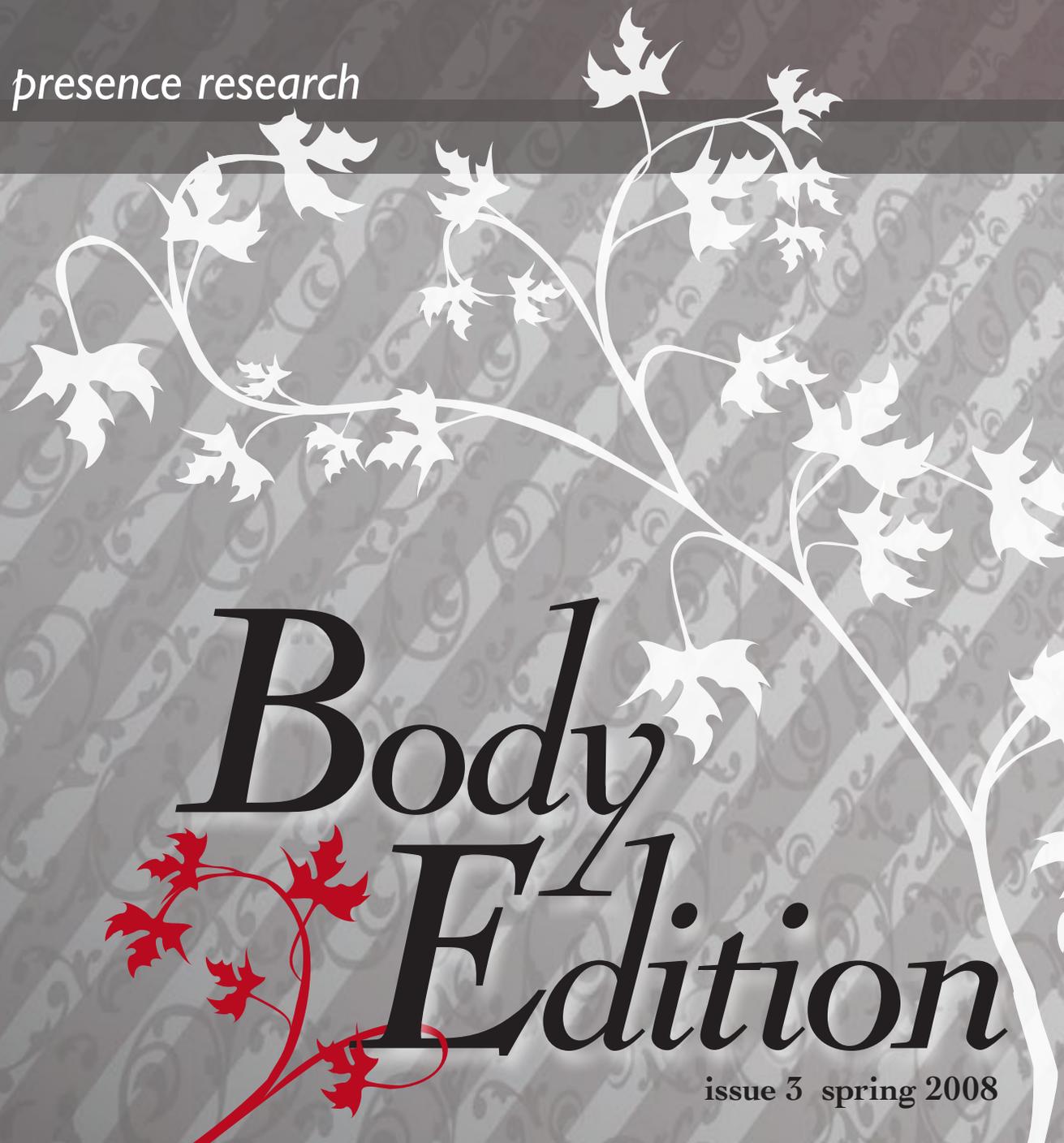
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# Keho

*the place for presence research*



# *Body E<sup>1</sup> Edition*



issue 3 spring 2008

## Welcome to the third issue of *Keho*: the place for Presence research

PRESENCE research is a maturing interdisciplinary field and this issue of *Keho* continues the editorial team's desire to explore work at the edge of Presence research. It is sometimes said that the well worn path is easy and safe, so *Keho* seeks out the boundaries of Presence research and reports back with the aim of both stimulating debate and inspiring research.

For this issue the *Keho* team have been checking out bodies, all for the good of Presence research. From the buffed and toned of the physical world to the pixelated and photoshopped of the virtual, no body has been exempt from *Keho*'s gaze. But why the body? Well, put quite simply it is with and through our bodies that we experience the world. One thing that the team has learnt during the production of this issue is that size is indeed important, so we are pleased to report that this is the largest edition of *Keho* to date – a total of seven articles make up the Body feature – each exploring different aspects of how both physical and virtual bodies enable us to experience presence.

But that's not all, on your behalf, we have Frolicked with Phantoms in Alex Davis's mixed reality installation space, we have Walked like an Egyptian, or least an ancient Roman, with the CyberWalk project, and returned to our childhoods as we experience the digitally augmented guidebooks of Bonner, Wilson and Nardi.

This issue of *Keho* firmly places the body at the centre of the Presence research agenda. What is clear is that our bodies play a multifaceted role in the experience of presence – they demarcate inside from outside; they enable us to feel present in the world and finally they let us impact on the sense of presence of others. The editorial team at *Keho* hope that you, and your body, will enjoy this issue that constitutes our continued desire to give a sense of place to Presence research.

### *Competition time!*

This issue we are giving away free CAVES for you to carry out your own Presence experiments, liberated from the confines of the lab - see page 40. All we ask in return is that you send us your photos of your CAVES in interesting locations. We will even give out prizes!

### *To stimulate, structure and support the Presence research community. For the community, by the community.*

*Keho* has been edited and produced by the Peach project with the aim of stimulating debate and discussion about Presence research, its future direction and its impact on society. Peach is the Co-ordination Action for Presence, under the EU Research and Development Framework Programme 6.

Published twice a year, and aimed at the wider Presence research community, the e-zine is available to download free from the Peach project's website. The e-zine is called *Keho* because this word refers to the phenomenology of mind and body in the Finnish language.

We really want to hear from you - please send us your news, contributions, comments and opinions. Presence is a truly interdisciplinary field and *Keho* is here to help people to connect.

[www.peachbit.org](http://www.peachbit.org)

## Contact

Contact *Keho* directly by email: [keho@peachbit.org](mailto:keho@peachbit.org)

Leave a comment on the *Keho* wiki:  
<http://keho.pbwiki.com>

The next issue of *Keho* will be available in Autumn 2008. To be notified by email, subscribe to *Keho*:  
[keho@peachbit.org](mailto:keho@peachbit.org)

*Keho* is produced at the  
Centre for Interaction Design,  
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*The views expressed in this publication are those of the individual authors and do not necessarily represent those of the Peach Project or the Centre for Interaction Design.*

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# Peach News

## *Presence 2007: Barcelona*

Barcelona in Spain was the venue for PRESENCE 2007, the tenth annual International Workshop on Presence, held last October. The event was organized by the International Society for Presence Research (ISPR) and Starlab in collaboration with Peach.

The PRESENCE Workshops began with a small, informal gathering of scholars and professionals interested in presence theory and research in June 1998 in Suffolk, England. Thanks to the hard work of conference organizers and the support of the growing presence community, the workshops have been held each year since then and have retained their single track format and productive but informal and very pleasant character. Last year the workshop was held in Barcelona's Foment d' Arts i disseny (FAD).

## *Presence 2008: Padua*

The goal of the PRESENCE 2008 conference is to bring together academic researchers studying Presence, content and technology developers, and interested commercial parties so they can meet, share experiences, present research, and exchange ideas.

Academics and practitioners with an interest in research, theory, technologies and applications related to the concept of (tele)presence are invited to submit their work for presentation at PRESENCE 2008 in Padua, Italy, on October 16-18, 2008.

Following the format of the previous successful PRESENCE workshops, PRESENCE 2008 will be an informal, highly interactive conference with distinguished invited speakers, paper presentations, special sessions on specific topics, and poster sessions. Ample time will be reserved for informal interactions between all participants, and several social events (included in the registration fee) will be organized to facilitate this. The submission deadline is May 1, 2008 at 11:59pm Pacific Daylight Time.

[www.temple.edu/ispr/conference/](http://www.temple.edu/ispr/conference/)

## The Peach Community

The community is formed by a list of members collaborating proactively in Peach. Anyone interested in Presence can become a member and become more involved in the Peach community by collaborating in different working groups (WinGs) created to address Presence issues such as protocols, standards, social impact, ethics and roadmaps.

The community now has more than 150 proactive members and it aims to consolidate the relationships between all the worldwide scientists working on Presence related questions. The close relationship between the members benefits the research community; helping scientists to be in contact with each other and giving them an opportunity to discuss, interact and enlarge their knowledge of Presence.

The Peach website is where the community can discuss and collaborate on different issues, and share opinions, data, experiments and experiences, as well as finding all the required information about Peach events and other Presence related events.

[www.peachbit.org](http://www.peachbit.org)



# Peach News

## *A Grand Challenge for Presence*

A panel session to address the future research lines of Presence was organized as part of Presence 2007 last October in Barcelona, Spain.

It was suggested that such a project should be aimed at the core objective of Presence: producing measurably "real" experiences through sensorial hacks: replacement (or augmentation) and interaction with "bits". It should be ambitious, hard, and medium to long term, around ten years. It should engage the needed communities in Human Cognition, Human-Machine Interaction and Machine Cognition around a focal problem.

Presence research lies at the intersection of human perception and cognition research, machine intelligence, and human-machine intelligence, and as such it needs contributions from a wide variety of fields.

The goal of Presence research is to develop science and technology to achieve successful replacement or interaction (i.e., presence, being there) and open up a wide range of powerful applications.

Finally, such a project should lead to major advancement in Presence theory, experiment and technology, and result in major positive social impact.

GRAND CHALLENGE ENTRIES WERE JUDGED BY THE PEACH TEAM, AND WINNERS ARE:

John Waterworth from the Umea University: *My self, my other selves and the selves of others*

Giuseppe Riva from the Insituto Auxologico Italiano: *Virtual Embodiment*

Maria Victoria Sanchez - Vives from the ICREA - IDIBAPS: *Grand panel session proposal*

## RAVE 08

TOOK PLACE AT THE INSTITUTE OF AUDIO-VISUAL STUDIES,  
UNIVERSITY POMPEU FABRA, BARCELONA IN FEBRUARY

### GIULIO RUFFINI'S OPENING COMMENTS :

**R**AVE means Real Actions in Virtual Environments. As you have no doubt inferred, this is an event in the context of Presence research but with a sharper focus: eliciting and measuring real actions in virtual environments.

I am here representing Peach, the FET Coordination Action under the theme of Presence Research in Action. The objective of Peach is to support and help unite the Presence community under well defined themes. The general objective of this field is to produce "real"-feeling experiences through sensorial replacement, sensorial augmentation and interaction with "bits" or digital media (full or partial immersion in simulated reality). As a result, Presence is a scientific and technological multi-disciplinary field requiring joint work in Human Cognition (how does the brain work and how can we "hack" it?), Human-Machine interaction (how can we establish efficient bidirectional links?) and Machine Cognition (how can we automatize the creation of "real"-feeling content?). A simple measure of success in Presence is this: If it feels real then it is Presence. Or more precisely, as it will be emphasized here, if you act as if it were possibly real, then it is Presence.

As a field, Presence is so intensely interdisciplinary that it can easily be susceptible to dispersion and defocusing. RAVE is certainly one of the strong themes that can help bring together the community and provide focus for advancement in science and engineering. So today, we will focus on something we can easily measure: real actions in virtual environments. Why does it happen that people respond as if they were in a real situation, when they are fully aware they are not? How can we better control this phenomenon, and so on. The scientific applications are many, but I would highlight the potential to shed some light on the mechanisms the brain uses to construct that fiction we call reality, which includes space, time, and agency.

RAVE-08 aims to be the first of an Annual Workshop Series focusing on the whys and hows of realistic action in virtual environments.

*For full details of the speakers and the programme visit:*

<http://rave08.peachbit.org/>

#### **Human n.**

A bipedal primate belonging to the mammalian species *Homo sapiens*.

#### **Computer n.**

An electronic machine which is used for storing, organizing and finding words, numbers and pictures, for doing calculations and for controlling other machines.

#### **Confluence n.**

A flowing together of two or more streams. The point of juncture of such streams. The combined stream formed by this juncture.

#### **Human-computer confluence n.**

A research program to investigate how the emerging symbiotic relation between humans and computing devices can enable new forms of sensing, perception, interaction, and understanding.

# Human Computer Confluence

## *A Proposal for a FET Proactive Research Initiative*

**This is a proposal for a program of research that seeks to employ progress in human computer interaction to create new abilities for sensing, perception, communication, interaction and understanding. This proposal is the product of a panel of 14 experts assembled on the 16th of November by the European Commission's unit on Future and Emerging Technologies to examine the future of human-computer confluence. After a lively brainstorming session, the result was a set of 15 inter-related research issues that were raised and explored in the discussions.**

#### ***UBIQUITOUS INTERACTIVE DISPLAYS***

Organic LED technologies make it possible to print large numbers of inexpensive and interconnected LEDs onto a paper or plastic substrate, creating such marvels as smart wallpaper and 3D displays. OLED devices are already being rushed to market as a highly energy efficient and reliable form of lighting. Over the next ten years, we should see increasing use of such "smart wallpaper" technologies used on walls, floors, ceilings, and furniture.

#### ***SMART OBJECTS AND TANGIBLE INTERFACES***

Fundamental technical challenges are raised by the ad hoc assembly of smart objects. For example, the problems of unobtrusive interaction, described above, become even more urgent when devices can not only flash, but also sing and dance.

#### ***SMART CLOTHING***

Wearable sensors can obtain information about physiological state (heartbeat, EEG, temperature, movement, arousal), as well as location and activity. Unobtrusive interaction requires placing the focus on the clothing, creating comfortable and maintainable garments, augmented with sensing, display, actuation and communications.

#### ***BRAIN COMPUTER INTERFACES***

A brain-computer interface (BCI) is a direct communication pathway between a human or animal brain and an external device. Invasive BCIs are implanted directly into the grey matter of the brain during neurosurgery. Non-invasive technologies have been used to power muscle implants and restore partial movement in an experimental volunteer.

#### ***NEW FORMS OF SENSORY PERCEPTION***

Sensory perception is the awareness of phenomena through physical senses. It may be possible to enable new forms of sensory perception for both natural phenomena and information using smart clothing, ubiquitous displays, brain computer interfaces or other technologies.

#### ***NEW SENSORY CHANNELS***

A definition of a sense might be "a system that consists of a sensory cell type (or group of cell types) that responds to a specific kind of physical phenomenon, and that corresponds to a defined region (or group of regions) within the brain where the signals are received and interpreted." The challenge is to determine if it is possible to create new forms of sensory channels by provoking a neural mapping from an artificial medium directly to an appropriate brain region. If such media could then be augmented with access to computing, this would create an entirely new form of sensory perception in which human awareness would be extended from physical presence into the computing milieu. The result would be a sort of "extended mind" in which computing would become a very powerful cognitive and perceptual prosthesis.

#### ***COGNITIVE AND PERCEPTUAL PROSTHETICS***

Cognitive and perceptual prostheses are computational systems that leverage and extend human intellectual capacities, just as the steam-shovel was a sort of muscular prosthesis. We propose to develop prostheses that can extend the cognitive, emotive or perceptual abilities of normal humans, in order to both augment existing perceptual and cognitive abilities and to enable new and richer forms of perception and understanding.

# Human Computer Confluence

## **MASSIVE-SCALE IMPLICIT DATA COLLECTION**

Over the last ten years, human computer interaction has increasingly migrated from isolated personal computers to web-based services distributed over the Internet. One of the consequences of this migration has been the emergence of systems that “harvest” web-based activity. Many commercial web services are shadowed by systems that silently collect information about how people interact with web pages, and what hyperlinks they use. A number of fundamental ethical challenges are raised by this possibility. Who owns the data? Who receives the financial gain? Should public environments be totally transparent (anybody can see anywhere at any time now or in the past) or should every individual have the right to protect a “personal bubble” of privacy? Does society have a right to impose collection against the will of individuals, as has recently become the practice with international phone traffic?

## **NAVIGATING IN MASSIVELY COMPLEX INFORMATION SPACES**

The massive amounts of data that may be collected about individual human activity by wearable or environmental sensors is only one of the variety of massive data sets that are increasingly available from the massive scale interconnection of computing devices. The challenge is to discover new means to present such data to individuals and groups to allow them to individually or collectively assimilate, explore and more fully understand the causes and consequences of known phenomena, as well as to discover and understand new phenomena.

## **COLLABORATIVE SENSING**

Human-computer confluence enables new forms of computer mediated human-to-human collaboration. One such form is collaborative sensing, in which large numbers of humans may join together to acquire or interpret massive data sets. A fundamental open question is how to use information and communication technologies to control the collection, integration and interpretation of sound, images and other sensor signals taken from distributed sensors.

## **SOCIAL PERCEPTION**

Ubiquitous sensing and communication increasingly make it possible for geographically distributed groups to share a sense of social presence. The challenge is to develop novel new forms of sensing and machine perception that captures relevant information, while respecting privacy, as well as novel new forms of display and actuation that can communicate social presence in a manner that does not distract or disrupt human activity.

## **COLLECTIVE HUMAN DECISION MAKING**

The new media created by human-computer confluence can enable new forms of collective decision making as well as collective sensing. A good decision making tool would help set priorities and integrate missing information with enough flexibility to support decision making under the pressure of continuously unfolding events.

## **THE NOOSPHERE**

The Noosphere [Verdanský 1926] can be seen as the “sphere of human thought” being derived from the Greek “noos” meaning “mind” in the style of “atmosphere” and “biosphere”.

In the original theory of Vernadsky, the noosphere is the third in a succession of phases of development of the Earth, after the geosphere (inanimate matter) and the biosphere (biological life). Just as the emergence of life fundamentally transformed the geosphere, the emergence of human cognition fundamentally transforms the biosphere. Confluence of human intelligence with a highly connected computing milieu, augmented with abilities for passive data collection and collective perception on a massive scale could bring about a form of Noosphere, in which human thought, cognitive efforts, and social behavior are supported by emerging technologies.

## **BENCHMARKING AND PERFORMANCE EVALUATION**

A program on human-computer confluence should be grounded on a solid basic science effort for validation and the specification of fundamental underlying principles. It is important to assure that resources are devoted to defining benchmark tests and performance evaluation metrics.

## **EXPLORING ETHICAL AND SOCIETAL ISSUES**

Many aspects of human-computer confluence raise fundamental ethical and societal issues. Emerging abilities such as passive data collection and collective sensing raise problems about ownership, privacy and individual rights. There is an urgent need to elucidate the ethical challenges created by human computer confluence, and to carefully explore the issues related to these challenges before unhealthy practices become custom.

*Verdanský 1926, Geochemistry and the Biosphere: Essays by Vladimir I. Vernadsky, English Version published in 2007 by Synergetic Press, Santa Fe, New Mexico.*

# Presence and the Body

Through our bodies we experience the world. Our skin forms a protective barrier, demarcating the inside from the outside. We monitor our bodies, the status of internal organs, our position in the world relative to other people, objects and environments. We are at once both observers of our bodies and observed by others, sometimes seen and unseen. This is the sense of presence that we experience on a daily basis with and through our bodies. The articles in this 'body' edition of *Keho* explore a range of themes reflecting a growing awareness of the role of the body in both experiencing and communicating presence.

Ravetto-Biagioli's discussion of Lozano-Hemmer's *Under Scan* challenges us to think how surveillance and advertising technologies have transformed a sense of embodiment in public. His work makes spectators aware of their presence and of the fact that they are being watched. *Under Scan* wants us to question the nature of public space and who controls that space and ultimately what impact that will have on our individual and collective sense of presence.

Savicic in his article *Yet Another Demon* seeks to reveal the invisible layer of the city that is composed by wireless networks. Taking cues from Situationalism, Savicic's piece entitled *Constraint City* enables the wearer to literally feel these networks as they walk the city.

In a series of pieces described in the article *Bodies in Space and Time*, Despina Papadopoulos explores how our bodies serve as an interface with the world, with our own intentions and with our own presence and definition. She raises the provocative question: is it easier to be present without a body? The pieces question the different ways in which our bodies intersect with the world around us and through this they aim to uncover more

about both our bodies and the world. While Savicic's article studied how the city's 'leaked' data impacts on our bodies, Papadopoulos acknowledges how now our bodies are also leaking data and information as we seek to reconcile our virtual and physical presence.

Naef and Boyd's article entitled *The Living Canvas* explores how the real-time projection of a moving image onto the moving body of an actor impacts on both the performer's and audience's subsequent sense of presence inspired by the potential for narrative enabled by the technology. While Mueller and Agamanolis in their article, *Remote Impact*, investigate how full-body interaction could be experienced by remote individuals.

Clothing our bodies is both a necessity and for some a pleasurable experience, that 'just out of the box' sensation is undeniably real and beguiling. Redaelli explores how augmented reality could offer future shoppers the visceral experience of purchase coupled with the ultimate product choice offered by agile manufacturing processes. Similar to Naef and Boyd, the effect is to extend the sense of presence enabling new narratives to unfold for both the audience and performer and in the

case of Redaelli, the consumer and producer. This raises the question: what do we imagine as we move our foot and admire our virtual shoe and where are we for that fleeting moment?

Finally, Moen in her article *Virtual Movements* discusses a theme that has permeated the previous articles: can movements of the virtual body impart the same information as its physical counterpart? She concludes her article with a timely reminder that an over reliance on a new generation of devices that sense and report our physical state, may result in the loss of our ability to make use of our innate kinaesthetic sense.

The articles in this edition of *Keho* firmly place the body at the centre of the Presence Research agenda. What is clear is that our bodies play a multifaceted role in the experience of presence; they demarcate inside from outside, they enable us to feel present in the world, and finally they let us impact on the sense of presence of others. All themes that echo Merleau-Ponty when he stated that "our body is both an object among objects and that which senses and touches them".



# Embodied Relations in *Under Scan*

KRISS RAVETTO-BIAGIOLI  
UNIVERSITY OF ABERDEEN

Rafaél Lozano-Hemmer's large-scale installations challenge us to think about how surveillance and advertising technologies have transformed a sense of embodiment in public space. He treats embodiment as an effect of a series of relations between the spectator and his/her own image, between the spectator and the work of art, and between the production of consumer desires and the forms of embodiment they elicit. Lozano-Hemmer's installations — *Displaced Emperors* (1997), *Body Movies* (2001), *Frequency and Volume* (2003), and *Under Scan* (2005) — show the continuities between the ways in which capital construes desires, consumers, and citizens, and the way people are studied, tracked as potential criminals and “activated” as consumers.

Describable as a form of “shadow play,” his installations make spectators aware of their presence and role in the work and of the fact that they are being watched, but do so in a way that confuses the voyeuristic erotic relationship between artwork and audience. The spectators' bodies activate the installation, but the installation responds by activating their sense of embodiment, thus demonstrating how new media figurations anticipate and control bodily responses. Embodiment becomes an awareness of being part of a process that undermines subjectivity as just another performative gesture rather than an existential experience

that reifies subjectivity through the eros of watching.

In *Under Scan* Lozano-Hemmer uses computerized surveillance technologies to detect the movement of passersby in the urban centers of various British Midland cities.<sup>1</sup> By shining intense light down onto town squares and thoroughfares, a tracking system of his design can detect and follow the shadows of the passersby and then project a video portrait within the contours of those shadows. For each shadow, the computer randomly selects one out of 1000 possible videos of a diverse ethnic and economic backgrounds cross-section of the British Midland residents. Each portrait is a short performance, involving a direct address to a potential spectator. Subjects were given minimal instructions: to lie on their backs, turn toward the camera, express themselves in any manner they choose, and finally turn away from the camera. Some perform elaborate movements, others dance, mouth words, wave, point fingers or simply rise up and stare into the camera. At first, the personae projected in the shadows seem to be sleeping, but once the passersby interact with them (by turning toward the video portraits, or stepping on them) they appear to wake-up and address the spectators. But if the spectators turn away, the video portraits respond in kind by turning away from them. Those looking at the video portrait see the moving image of another

person that appears to be as interested in watching the spectators as the spectators are in watching it. These portraits create an illusion of intimacy — an ephemeral contact with an “other”— and yet this seemingly personal interface is uncannily impersonal, not unlike the advertisement on the walls and in the windows of near by stores.

*Under Scan* was commissioned to upgrade the cultural profile of the East Midlands to attract “major new capital developments”<sup>2</sup> to the area, and perhaps its video portraits play with the genre of advertising. But these portraits appear to be more vulnerable and therefore more “real” than advertisements: they represent subjects projected on the ground directly addressing an unknown audience. Some passersby do not perceive this implicit intimacy as revealing or seductive but expressed discomfort seeing themselves coupled with a portrait that seemed to address them directly. Even if passersby are

conscious that these personae are performing for the sole purpose of exhibiting themselves to others, this mode of exhibition upset the anonymity they expect in public space. Whereas the direct address of advertising and other mediated couplings (online dating services, webcam sexual performances) clearly reveals the trajectory of desires, no explicit assemblage of desire is inscribed in these portraits. That’s what makes them a threat. Far subtler than advertising, reality television, or webcams that spectacularize self-revealing as a media event, *Under Scan* questions if mediated acts of self-revealing can be distinguished from the spectacle of self-exposure, the collapsing the all too personal into the impersonal.

Shadowed by an image cast uncannily within her or his own silhouette, the spectator is rendered vulnerable. S/he becomes a moving target for impersonal and yet highly planned and processed acts of personalized

exhibitionism, coming either in the form of art or advertising. The uncanny relationship between the ghostly images of others in public space, surveillance technologies, urban renewal investments, and advertising points to the complex questions that *Under Scan* wants us to ask about how surveillance systems, global capital, and digital technologies have reconfigured notions of embodiment and public space, and of the public itself. Every seven minutes, the public’s interaction with their own shadows and with anonymous doubles (possible others, possible selves) is suddenly revealed as an interaction with shadowing devices when the fourteen different matrices on which the pedestrians are mapped and tracked are suddenly projected onto the ground. The joke, however, is not on the passerby but on the surveillance technologies themselves, which Lozano-Hemmer uncovers in the same way they were supposed to uncover suspects, flush out “sleeper cells,” and bring terrorist conspiracies to light. These matrices swirl around and finally converge into one large grid, where individual shadows of passersby are replaced with a white line (indicating where the passerby is and where s/he is headed). Both the video portraits and the matrices point to the fact that we are caught in the act of watching and being watched. And yet, when we look at the projected image of the matrix we see only a copy of the various grids used to map out our locations and trajectories, signaling the transformation of a human image (the video portrait) into a nonhuman image (the matrix). The spectator is enframed by this image not as a human but as an index or a vector. Because video portraits and network images are continually alternating, it is not clear whether it is the human figure that is translated into a data set or whether this complex data is made “userfriendly” through an interface that looks like a human image. *Under Scan* parodies the relational aesthetics of the Internet, where interface (the projection of figural images) simulates human interaction.



It is hard to place *Under Scan* in specific category of art practice, since it employs aspects of performance, digital installation, as well as site-specific and interactive art. Lozano-Hemmer defines his own work as “relational architecture” and “relation-specific art” and distinguishes it from “site-specific,” “virtual,” and “relational aesthetics.”<sup>3</sup> He produces local interventions to explore and expose topographical relationships, creating temporary groupings that allow the public to experience themselves as connected to both public space and other people. His work also responds to the fact that public space and public relations have already been territorialized by various commercial, political, and military regimes: “the urban environment no longer represents the citizens, it represents capital.”<sup>4</sup> Urbanism itself is just another mode of appropriating public space by capitalism’s information economy, and a way of continually “refashioning space into its own setting.”<sup>5</sup> Lozano-Hemmer’s “relational architecture” does not claim to liberate the consumer-citizen from social controls in some endless free-floating modulation. It reminds us of the visible and invisible architectures that are already in place around us in a manner that it is open to unexpected surprises that have the potential to disrupt capital and its flows. It is only in relation to such networks that we continue to produce subjects (identity politics) and repeat acts of subjectification. The point is not to condemn one position or identity in favor of another — to declare victims and victimizers or to return to the bounded individual of disciplinary societies — but to visualize and animate how positions, bodies, and identities are themselves in flux, activated, deformed and transmuted by the flows of capital, media, surveillance and information technologies. By revealing traces, residues, and aporia, he reveals both the inherent violence and absurdity of mechanisms of control. His strategy is not designed to make connections across the social spectrum (these connections

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of the public itself***

are always being made, unmade and remade), but to allow us to see ourselves as part of the mechanisms of control.

In response to large-scale privatization, gentrification, and “urban renewal” projects, there have been attempts to reconceptualize what “public” means — to distinguish the “public” as an idea from the “public sphere” as a set of political relations. Lozano-Hemmer sees his art as one that does not create a form of consensus, but fosters various forms of feedback. It is not clear, however, what “feedback” might mean within the framework provided by “Under Scan,” where human agency does not seem to have much to do with the work’s own power to activate or modulate us affectively. After we activate the video portraits, we can only choose to ignore, interact with, or turn away from them. The surveillance devices can instead trace our trajectories, disguise their own presence through decoy images (the video-portraits), make their presence known, and make our movements known to others around us. Public reactions are not coordinated — some people respond respectfully to the video portraits, walk gingerly around them, or try to communicate with them, while others jump on the images, or insult them. At the same time, pedestrians are related — excessively so — by the surveillance technologies and their own awareness of being watched by each other and by those devices. This creates rather complicated forms of relationality as series of assemblages, layers, and processes — between one person and another, between man and machine, and machines and machines. When the surveillance grids are revealed, the passersby who stop to look at the video portraits suddenly find themselves grappling with a series of uncertainties — are they framed or activated? Spectators or actors? Observers or observed? *Under Scan* reflects and produces these uncertainties in the form of uncanny confusions. The images of supine

others function as doubles for the pedestrians’ own shadows, but also dissolve into images of the pedestrians. These self-images, however, are not figural but digital. As the spectators’ movements are anticipated by the surveillance system’s tracking of their shadows (an image of some virtual future), what the passersby see before them is only a pre-recorded image transmitted from some unknown context and location.

The appearance of ghostly images of local citizens cannot be attributed to a lack of political voice, since the very projection of these images can be seen as a political act on public space. Yet this is not the politics of sit-ins or taking over public space. Instead it is one of potentialities — potential actions, reactions and interactions. This is an interaction based on no apparent feedback. Unlike television that does not allow for an immediate interactive response, *Under Scan* provides a potential address and potential response. But it is this potentiality (virutality) that makes each gesture appear to be a performance — a conscious staging of self-expression for visual consumption. *Under Scan* both promotes interaction as much as it forces us to be conscious of how our reactions to others establish relations.

1 *Under Scan was commissioned by the East Midlands Development Agency and The British Arts Council to energize the cultural centers of Derby, Leicester, Lincoln, Northampton and Nottingham.*

2 See [http://www.artscouncil.org.uk/press/news/event\\_detail.php?id=65e3&browse=archive](http://www.artscouncil.org.uk/press/news/event_detail.php?id=65e3&browse=archive)

3 Lozano-Hemmer’s notion of “relational aesthetics” should not be confused with Nicolas Bourriaud’s “relational aesthetics.”

4 Lozano-Hemmer, *Subsculpture*, p. 11.

5 Guy Debord, “The Organization of Territory,” in *The Society of the Spectacle*, trans. Ken Knabb (New York: Black and Red), section 169.

# Yet Another Demon

GORDAN SAVICIC

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If electromagnetic waves are the new medium of an urban city-wide communication system, then our everyday life is unavoidable surrounded by an invisible information cloud, built upon wireless interconnected networks. More than a hundred years ago, the discovery of radio waves, used for personal communication, has led to various wireless utopian visions. Nikola Tesla's dream to broadcast free energy without wires through the aether is just one example, among others, where an engineer's utopia has been stimulating the notion of personal communication freedom.

## BUBBLE

But the wireless bubble is nowadays as tempting as back then. Artists are exploring and discovering electromagnetic waves as source material for their work. Very often they don't just aestheticize its occurrence, but showcase a critical reflection upon those emerging network structures. Armin Medosch investigated this particular fact very comprehensibly in his paper *Not Just Another Wireless Utopia*, published in 2004. He reflects upon the law of physics (electromagnetic waves) and the technological properties of communication media for contemporary media theory, media studies and media art. During the last years, the networking technology 802.11 (WLAN) experienced an increasing boom, basically breaking through any urban



space and adding "yet another" frequency range into our electromagnetic spectrum. Since the hardware prices for wireless products have fallen dramatically, these systems are getting more and more ubiquitous. Albeit, our bodies never literally experience the emergence of those wireless networks; unless you have a WIFI-enabled device in your hands. But, what are the effects of this hidden city double?

## WAVES, WHAT?

They constitute an invisible city, an architecture which is subconsciously perceived

and which constantly oscillates as resonant landscape bypassing people, animals, trees and buildings. In case of wireless networks, it's interesting to note the paradigm shift of public and private space into that invisible layer. Securing your network by certain available standards (WEP, WAP) transforms your network into a private space while still dripping into the aether, in that case the public space. Closed network points restrain your access to this layer of information. Thus, being expelled from network connectivity can be a painful situation and harm you to some extend.

The artistic project *Constraint City / the pain of everyday life* lets you literally feel this pain by recompiling a Situationist's technique for strolling around a city (Psychogeography) into a sarcastic wearable media device. A chest strap (corset) equipped with high torque servo motors and a WIFI game-console (a Nintendo DS) are worn as fetish object by the artist. The motors automatically tighten the straps when an enclosed wireless network is detected: the stronger the WIFI signal is, the tighter the jacket becomes. By wearing the straight-jacket, the artist not only writes, but is at once also able to read the city code. Hence, the outcome of his walk is provoking an emergence of a city-shaped body formed by surrounding electromagnetic waves. This is certainly a new way of experiencing the city in its most invisible appearance, following the playful movement of a psychogeographic walk. Furthermore, you can turn it easily into a RealGame (a term coined by the Ludic Society) by asking your friends to pinpoint encrypted WIFI routers against you. A *Constraint City* Walk is typically followed by a computer-generated map, depicting the route which has been recorded via GPS and all encrypted WIFI access points plus their average SPR, the "Signal-to-Pain Ratio". So far, parts of Berlin (02/2008) and Vienna (06/2007) have been individually experienced. Further cities are in preparation, Gijon in April 2008 as next destination. These maps are open for a variety of speculative interpretations. For example, Kreuzberg in Berlin, a densely populated district with alternative flair and melting pot for various cultural backgrounds transformed into highly WIFI-polluted area compared to the region around Potsdamer Place with significant fewer Access Points. Although the Sony Center itself might be a symbolically higher charged area regarding the restriction of personal communication freedom than any other place in the city.

### **REAL OUTCOME**

While the project *Constraint City* artistically plays with the notion of derive and its translation of waves into pressure of pain onto the body, the artistic research project *Skrunda Signal* from Latvian-based RIXC collective deals with the real outcome for humans and the electromagnetic conspiracy around the mythical past of a Soviet early warning Radio Location Station (RLS). It has been operating from 1967 to 1998 near Skrunda, a small village in Latvia where two HEN HOUSE radars were operating. RIXC's spectral investigation brought up some interesting facts about Cold War Politics and human exposures of Skrunda's local population. Allegedly these powerful transmitters were responsible for shutting down radio transmissions on at least two occasions for up to ten minutes in the 1970s. Till now investigations have revealed a number of statistically significant changes associated with exposure to the radar signal. A significant reduction in growth ring increment of nearby pine trees was found, among other effects on nature. As continuous dispute, the international festival hosted by RIXC in 2007 focussed on the issue of "Spectral Ecology", considering interpretations of the post-industrial human and interconnections between the environment of his creation and the living nature.

### **BODY HARM**

A much more radical approach of experiencing real and virtual place via mediated bodies, buildings and objects is being introduced by the international collective Ludic Society. The injection of a "RFID Judgement tag" under the skin is mandatory for joining their multi player computer game *Tagged City Play*, being performed in real cities. The situatedness of this pervasive play is given by the use of mobile and ubiquitous computing devices. Their slogan "We sell play – no games" hits the mark. There are no fixed rules but a clearly defined

goal of the game, namely, the de-pricing of networked things by writing Zero Values to RFID tags. These actions are fed into an online map, a so-called Borgesian 'pata-active map which displays a meta-game played 1:1 in the Reality Engine over the city, blowing up the most tagged sites with the value Zero. Please notice their disclaimer: We are not responsible for any physical or mental damage during and afterwards the PLAY.

As a conclusion, we have to "in-superstitiously" ask ourselves, whether a new demon in the aether is arising or not?

### **Acknowledgements:**

*Many thanks to Margarete Jahrmann, Florian Cramer, Martin Howse, Bela, Gobai and Felix Wilke for their help and inspiration during the realisation of Constraint City.*

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*Martin Howse: The Aether and its Double, 2007*  
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*Simon Sadler: The Situationist City, 1999*  
*Armin Medosch: Not Just Another Wireless Utopia, 2004*  
*Margaret Cheney: Tesla: Man Out of Time, 2001*

### **Links (2008):**

xxxxx: <http://1010.co.uk/>  
RIXC: <http://rixc.lv/>  
Ludic Society: <http://www.ludic-society.net/>  
Constraint City: <http://pain.yugo.at/>  
Medosch: <http://theoriebild.ung.at/view/Main/WirelessUtopia>  
Global Security: <http://www.globalsecurity.org/>  
Cyber Command: <http://www.afcyber.af.mil/>  
Skrunda Radar Study: <http://preventemf.com/Cherry%20Report/PART5.htm>

# Bodies in Space and Time

DESPINA PAPADOPOULOS

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WITH all this time in between, the imaginary finds time to meet the real, and if the two do not coincide the repercussions are not great, just disappointing.

In the world of interaction design an interface is a loaded term. We think of keyboards and mice as interfaces, we create “alternative” interfaces based on gestures, motion, optics and haptics. We think a lot about interfaces and how to develop natural or transparent ones, how to minimize the distance between systems and behaviours.

Yet, close as it is, we never think of our body as one. In many ways our bodies serve as just that: an interface between the contours of the world, and our own intentions, our presence and definition – our own contour.

Is our body our contour, or just another malleable presence in the world of parallel universes? One membrane that progressively collides and negotiates its identity with that of a membrane that circulates in another dimension?

Such open ended questions seem more at ease in a physics discourse, or maybe even science fiction, but when facebook and mySpace intersect with notions of physical self(s) then they become pressing objects of material contemplation.

At times it seems that we glossed over the part of the philosophical discourse from that which is never embodied, (is it possible that Heidegger’s “ready-at-hand” was one of the rare mentions of an active, physical reality in

the west’s philosophical literature?) to one that is embodied in a multiplicity (virtual, gendered, sexualized, etc) and which in some perverse way still manages to strip the body of its swings, moods, curves, gender - zits and all – if you will.

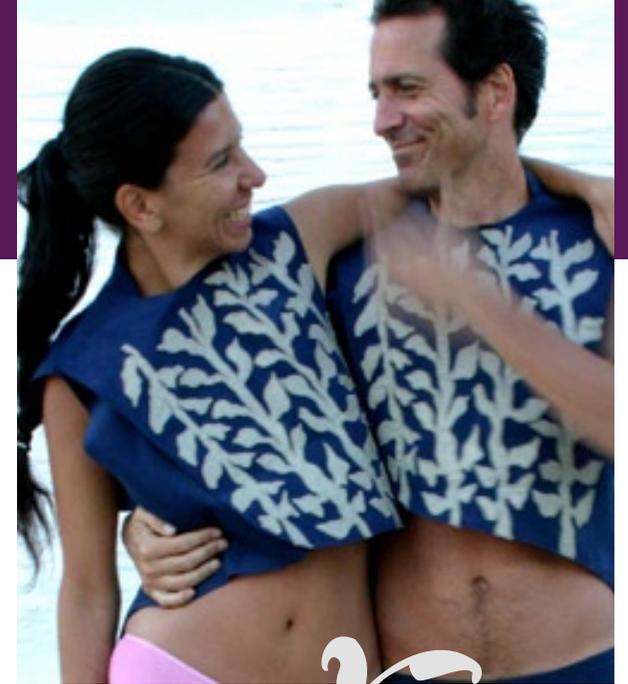
Genesis 2:25 tells us that “the man and his wife were both naked and they felt no shame.” But later “the eyes of both of them were opened, and they realized they were naked; so they sewed fig leaves together and made coverings for themselves. Then the man and his wife heard the sound of the LORD God as he was walking in the garden in the cool of the day, and they hid from the LORD God among the trees of the garden. But the LORD God called to the man, “Where are you?” He answered, “I heard you in the garden, and I was afraid because I was naked; so I hid. And he said, “Who told you that you were naked?”

Who has been telling us ever since that we are naked? Is our existential nakedness finding refuge in a disembodied reality? Is it easier to be present without a body?

In my work I think a great deal about what it means to have a body- and how technology, that techne that makes one devise devices, can articulate, if for a fleeting moment, what at different times I have called philosophy machines, non-verbal communication, or the synaesthetic materiality of ideas.

## THE IDEA REMAINS MOSTLY THE SAME:

A body circulates in space, but it contains the desires, energies, memories and, non-material



aura that a body is most adept at having: it moves, it interfaces, it interacts: it swings, it hides, it reacts – it is unpredictable in much the same way that “the 11th dimension is closer to the clothes in your body and yet we cannot sense it.”

What I have been exploring is ways in which to articulate ideas in space and elucidate the various relationships they form with space. To use another loaded term, to “embody” ideas, see how they fit and drape on a body - to, in many ways, intervene.

## THE ACTUALIZATION OF IDEAS IN SPACE

My work on the Masai Dress is meant to create new folds in our interactions with space and give an aural dimensionality to the relationship of body- motion- space. Inspired by Masai wedding collars, this dress salutes both our global provenance and our desire to create our own soundtrack as we move in mysterious ways. With every step, strings of hand-formed silver beads that hung from a leather collar, brush against conductive threads sewn into the dress, generating a series of sounds emitted

through 2 speakers sewn under the collar. A leisurely walk or a night at a party turns into an improvisational performance while at the same time the swaying of the body is translated in musical notation. A wearable wind chime in effect, the Masai Dress calls into attention the way bodies cut through space (and time).

A snug, fleece sweater sports a radiant yet discreet temperature-display on each sleeve (one in F° and one in C°). The sweater's cut embraces the body from all sides, a cozy version of the armor and a sexier version of fleece. Made of two interlocking panels, the sweater mimics early construction techniques where loom widths dictate the rules of construction and design. In a humorous way, the temperature sweater engages in an immediate relationship between the "outside" (the world and its temperature) and the "inside" (the body wrapped inside the sweater). With a simple LED display and a temperature sensor, this thin film that forms between the body and the world is both emphasized and pricked. At the same time the temperature sweater plays on our reliance to internet sites such as weather.com and wrunderground.com to know what the weather "feels" like. And as Marianne Faithful sings, "all over the world, strangers talk only about the weather," the temperature sweater invites a conversation or just settles an argument, when walking down the street, on a cold February night, about exactly how cold it actually is.

In order for the HugJackets to work, they demand a deliberate act of union. An embrace between two wearers activates a pattern of LEDs and a "heartbeat" sound.

An intricate quilted pattern made of conductive fabric is sewn on the front of each jacket. When two people wearing a HugJacket embrace they actually power each other up through that pattern. This symbolic energy transfer becomes fully actualized and the embrace is instantly translated into an explosion of light and sound. The HugJackets technology itself

is astonishingly simple – it is the intricate patterning and placement of the conductive fabric that allows for the surprising connection and effect to take place. The two jackets, through their twined pattern, literally plug into each other's battery source in order reveal the transformative energy that is generated in each embrace.

The ClickSneaks were conceived in the most pedestrian manner. Walking down a cobblestone street, wearing a comfortable pair of sneakers next to a friend wearing a stunning pair of high heels. The sound of the heels echoed through the night, each step producing a rich aural environment; what if the comfortable sneakers could partake in this world of poignant allusions?

Part fantasy, part irony, the ClickSneaks subvert both the traditional attributes of a pair of shoes, and expose the multi-layered relationship we have with our clothes and accessories.

For the ClickSneaks the sound of the inspirational high heels has been recorded, only to be activated on each step the revamped sneakers take. Surface mount technology makes it possible to fit the necessary components in the sneakers: the original "click" sound is recorded on a voice chip, while a speaker, amplifier and an accelerometer acting as a "switch", transform these seemingly normal sneakers into a flighty performance.

What is maybe even more surprising than a pair of sneakers that sound like high-heels is the fact that wearing the sneakers makes one feel like actually wearing a pair of high-heels. The staccato sound erects the body in a similar way that wearing high-heels does. The body reacts to the sound in a physical, immediate way, indicating the complex relationship we have with our bodies and the tricks we can play around them.

Real bodies, virtual bodies, augmented bodies, technological bodies: do they intersect to form a



subtle body, the body that we end up inhabiting and sharing with the world and others? In using technology and building wearable structures that support them, I try to bring forth the physicality of being, the magic of technology and investigate how by combining the two we can find ways to embody ideas and explore new ways in which we relate to both our body and technology.

As Maurice Merleau-Ponty so eloquently describes in his book "The Visible and the Invisible" our embodied objectivity is revealed in the interplay, the X, that is formed between the world and us, between the self and the other. "There is an experience of the visible things as pre-existing in my vision, but this experience is not a fusion, a coincidence: because my eyes which see, my hands which touch, can also be seen and touched, because therefore, in this sense they see and touch the visible, the tangible, from within, because our flesh lines and even envelops all the visible and tangible things which nevertheless it is surrounded, the world and I are within one another, and there is no anteriority of the percipere to the percipi, there is simultaneity or even retardation."

By exploring the different ways in which our bodies intersect with the world around us we will uncover more about both our bodies and the world. Our urban landscapes, our buildings, both our interior and exterior lives are becoming progressively more and more entrenched in the uses of technology. Buildings leak out data, the thick spectra of data and "intelligent" environments are becoming part of our natural habitat. In the process we become part of that spectrum, we start to also "leak" data and information and combine our virtuality in a physical presence as well.

In looking through the cracks and building new models of interaction we might be able to locate our multiple bodies in a new type of materiality.

*MARTIN NAEF, THE GLASGOW SCHOOL OF ART*  
*CATHIE BOYD, THEATRE CRYPTIC*

IMAGINE a performer on stage changing shape and colour right before your eyes. Imagine the same actor playing several roles in a play, changing costume in the blink of an eye. A new visual language on stage - that is what the Living Canvas initiative is all about.

Using projection technology on stage has become ubiquitous in contemporary multimedia performance, and has even been adopted in more traditional art forms such as opera. Projection screens have become an element in nearly every modern stage set, enabling a dynamic world created by video artists. Projectors are also increasingly used as a very dynamic and controllable tool for the lighting designer, exceeding traditional stage lighting technology in terms of flexibility and very small-scale control of colour and intensity. The Living Canvas initiative aims to go one step further by using the performer as the



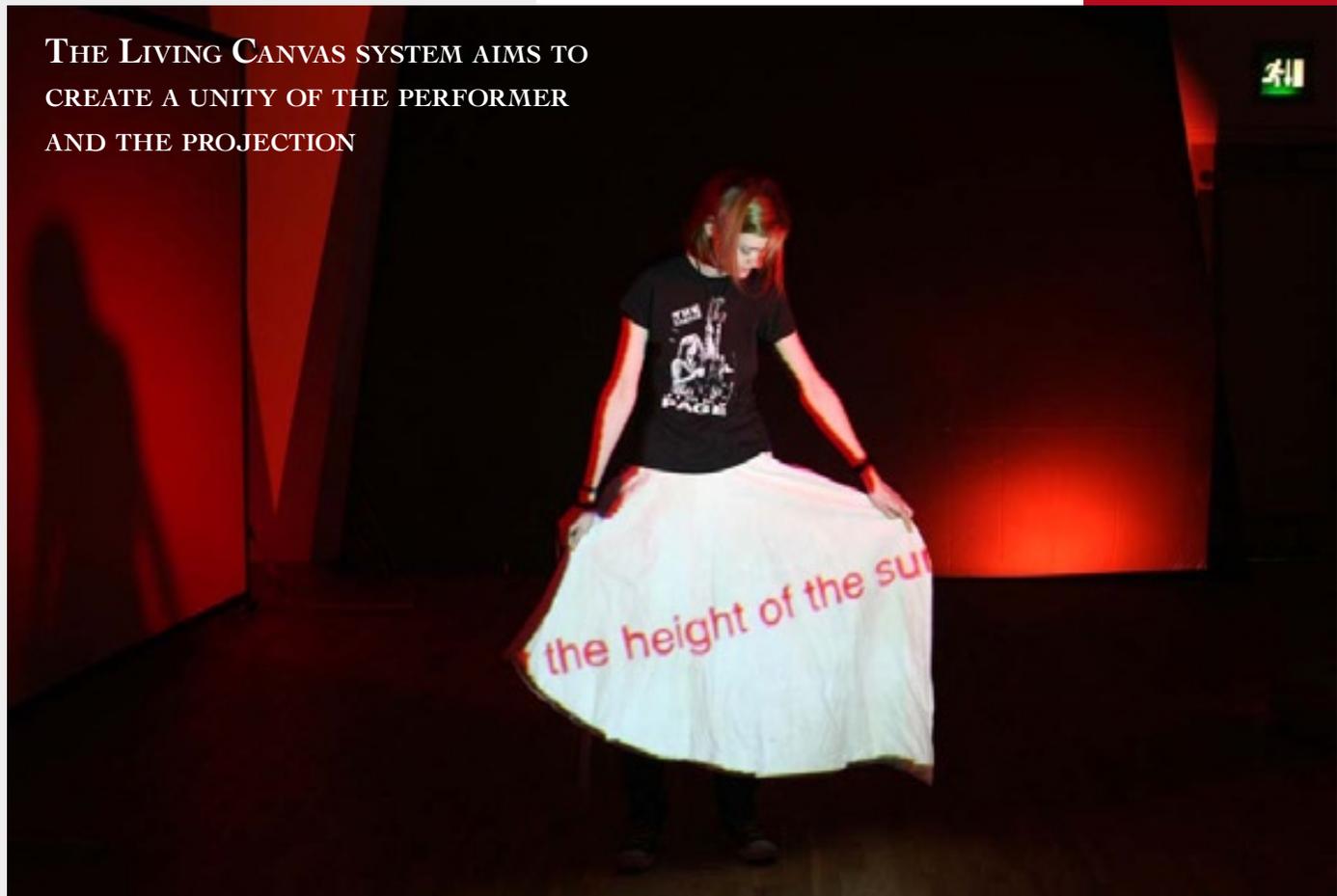
# The Living Canvas

*Towards a new form  
of Presence on stage*

main projection surface. Previous projects have explored similar territory, such as Favre's *The Making of Americans* or Obermaier's *D.A.V.E.* where video is projected onto the performer. These productions, however, required the performers to follow a very strict choreography, making sure they assume the intended pose to receive the video at the right time: The performance is driven by the video. The inverse situation is explored by a range of projects where motion capture technology is used to generate video, allowing the performer to interact with and drive the video system. The Living Canvas system aims to create a unity of the performer and the projection: By following the performer on stage and detecting the pose, machine vision enables the projection system to react and adapt to the performer immediately. In that respect, Living Canvas follows in the footsteps of the *Jew of Malta* production (Art + Com Media, 2002), but it pushes the boundaries further by exploiting the rapid advances in processing power and machine vision technology.

At a first glance, the problem seems mostly a technological one. Indeed, the initial idea for the initiative was sparked by working on projects acquiring images of a user standing inside large-scale, virtual-reality projection environments to enable tele-presence during remote-collaboration scenarios inside synthetic virtual worlds. The technical challenges are very similar: For a tele-presence system, reliable image acquisition has to be integrated into a large projection system without interfering. The blue-c project, developed at ETH Zurich between 2000 and 2004, solved the issue by tightly controlling the projection system with a range of synchronised shutters, flashlights, cameras and projection screens with controllable transparency. A follow-up project with Ewha Womans University in Seoul simplified the problem and moved the tricky

## THE LIVING CANVAS SYSTEM AIMS TO CREATE A UNITY OF THE PERFORMER AND THE PROJECTION



machine-vision tasks into the near-infrared spectrum where there is no interference from the projectors and which can be controlled invisibly to the user. Conceptually, the Living Canvas simply inverts the problem by replacing a colour camera with a projector, replacing colour acquisition of the user with colour projection onto the performer.

Despite its roots, the Living Canvas initiative is not a technology-driven research project. Instead, the close collaboration with Theatre Cryptic was established well before the first line of code was written. Without the

early input from an artist experienced in stage production using a range of media, a technology such as Living Canvas is likely to remain a "gimmick" instead of supporting the narrative. Instead, the requirements are dictated by the artistic vision and needs, and prototypes of the technology are reviewed within a stage setting to ensure the relevance and fitness for purpose.

The Living Canvas initiative is split into three main phases. The technical feasibility of the core technology was established in summer and autumn 2007. We are now in the process

of acquiring the funds to turn the prototype into a mature and fully featured system ready for deployment as part of Theatre Cryptic's show planned to go on tour in 2010. The third and final phase will reflect upon the impact of the new technology and its artistic potential by observing and interviewing the artists and audience during and after the tour.

### *THE TECHNOLOGY*

The Living Canvas system is designed to project directly onto the performer, but avoid any spill onto the background to enable maximum freedom for the set designer. It uses machine vision to acquire the silhouette of the performer against the background and masks a video stream accordingly. The key issue is to keep the total system latency as low as possible: Any delay between the actual movements until the projection is updated is visible as a "shadow" whenever the performer moves and therefore restricts the performance.

The processing pipeline is fed by a greyscale high-speed digital camera. The camera is equipped with IR-pass filters to only pick up the near-IR spectrum that is invisible to the human eye and totally independent from any active projection system, therefore enabling the camera to see in the dark once the stage is illuminated with IR lights built to support night-vision in CCTV installations.

The greyscale image is then segmented into foreground (the performer) and background. Living Canvas uses computer vision algorithms based on background subtraction with additional noise reduction steps that were highly optimised for speed. This segmented image is used to mask the projection: The mask derived from the camera is warped into the image space of the projector, and any projector pixel corresponding to the image background is set to black. Pixels corresponding to the

THE REQUIREMENTS ARE  
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foreground receive the colour from a separate video stream, which represents the actual content to be projected onto the performer.

The overall system latency is dominated by the inherent buffering and transfer between the various hardware components. From the total latency of 30 to 40ms, only about 10% is actually spent doing machine vision tasks in software. Lowering system latency further would require custom hardware.

If the camera and projector have been aligned and calibrated properly, the system projects onto the performer exclusively. Calibration is conducted by projecting a checkerboard pattern and automatically detecting the corresponding corner points in the camera image, a process that can be initiated quickly by a stage technician. Although the method is a

simplification of the underlying problem, it has proven to be precise enough for the needs of this particular project.

The video to be projected is generated in real-time using Cycling74's Max/MSP/Jitter. This tool has become a widely accepted standard for live video performance. Connecting Max with the Living Canvas system allows video artists to use the tools they are familiar with and saves us from the need to build dedicated video generator utilities just for Living Canvas. The video is streamed asynchronously to the projection system, therefore de-coupling the two systems: Even if the video generator system runs complex and potentially slow rendering algorithms, the projection system still updates at its maximum rate, avoiding "shadows".

Additional machine vision tasks are conducted in a parallel pipeline that runs at a lower speed than the main vision pipeline described above. These tasks include the extraction of markers, built using near-IR LEDs that can be worn by the performer. This is a first step towards full posture detection. We have also introduced experimental code to retrieve the position of individual performers.

### *TESTING THE SYSTEM*

The prototype system was tested successfully during a week long exploration workshop involving artistic director, video artist, stage manager and multimedia technician. The aim of the workshop was to assess the technology as well as to provide hands-on experience for the artist to gain a better understanding of the medium. The results of the workshop were very positive. The technology worked with very few issues despite the early stage of the project. Once calibrated, precision was clearly sufficient for the experiments. While shadows caused by the system latency were visible during several experiments, the artists actually felt inspired by the effect and did not identify these as a problem. Nonetheless, motion prediction schemes have to be introduced if the technology should be used in a dance context with faster movements.

A special focus was put on the interplay with stage lighting. While the technology prototype was developed with a tightly controlled environment in mind, the vision system proved to be relatively robust even when using high-powered stage lights that emit a very strong near-IR component. Care has to be taken, though, not to visually overpower the projection system with bright spot lights.

Similarly, the video content has to be chosen wisely: In the presence of stage lights, high-contrast content is clearly preferred, and colours are washed out easily.

### *THE WAY AHEAD*

With the basic technology in place, we are now venturing towards implementing the full vision. On the technology side, posture detection is the major missing link. In order to implement the idea of a virtual costume, the system must not only have a silhouette to restrict projection, but also knowledge about the actual pose in order to project video onto specified body parts.

While the necessary technology aspects are reasonably well understood, the most interesting challenge will be the deployment of the technology within an actual stage production. The ongoing discussions between artists and engineers have already spawned a lot of ideas, and the artists had a first opportunity to explore the system during the workshop. Nonetheless, we are still far away from a full understanding of the new visual language that the Living Canvas enables, but we are most optimistic that by the end of our journey, an exciting new piece will be brought on stage to ravish the senses.

### *ACKNOWLEDGEMENTS*

*The feasibility study was funded by the UK Arts and Humanities Research Council (AHRC) under grant AH/E006698/1, with additional support from Theatre Cryptic. We would like to thank everybody involved in the November workshop, including Jason Dee, Angelica Kroeger, Claire Moran, Carrie Taylor and the team at the Centre for Contemporary Arts, Glasgow.*

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## *Shadowboxing over a distance to support Social Presence*

# Remote Impact

*FLORIAN 'FLOYD' MUELLER, STEFAN AGAMANOLIS  
DISTANCE LAB*

**R**EMOTE Impact is a “Sports over a Distance” game that offers a full-body contact experience between geographically distant players, similar to contact sports. The game encourages extreme physical exertion and, unlike the Nintendo Wii and other console games, it recognizes and encourages intense brute force. Our work aims to introduce brute force interactions, such as exhibited in combat sports, to human-computer interaction and presence research. In particular, we want to point out the elements of exertion, force and full-body impact and the role they can play in supporting social presence. *Remote Impact* supports distributed participants, so that players in different cities can experience a physically intense game together, without getting hurt. We believe the physical intensity of the game can contribute to general fitness, weight loss, and stress relief

while at the same time allowing players to socialize and create new friendships over a distance in an entertaining sportive way.

### *WHAT DOES SPORTS HAVE TO DO WITH PRESENCE?*

Current widespread information and telecommunication technologies such as instant messenger, mobile phone and videoconferencing can support factual information exchange and business-oriented tasks, but they do not adequately facilitate opportunities for building a trust relationship and team-building experiences between distant participants. On the other hand, traditional contact sports like football, rugby, and martial arts are well known for their effectiveness in rapport building, bonding and teaching social skills<sup>10</sup>. Sports and exercise activity



are believed to encourage team-building and support individual growth and community development<sup>11</sup>. Some argue sport can foster social integration and personal enjoyment<sup>12</sup>. From a physical health perspective, sports can also contribute to a healthier body, reducing the risk of obesity, cardiovascular disease, diabetes, and more<sup>8,9</sup>. It should be noted that not all sports are the same or provide identical benefits. However, most of them involve participants voluntarily investing in physical exertion. In particular contact or combat sports -sports in which the rules allow physical contact with other players- are often associated with intense physicality and brute force. Sport activities such as American football, ice hockey, wrestling and boxing are characterized by their explicit support for body collisions that facilitate brute force. Although these sports can be dangerous for the participants' health, they are very popular and many players enjoy participating, despite the risks<sup>13</sup>. Remote Impact aims to provide the benefits to participants who are in different places.

### *REMOTE IMPACT*

We have built a prototype of a Brute Force interface that supports two participants, located in two geographically different locations. The gameplay of *Remote Impact* is as follows: The two remote players enter the identical interaction spaces. A life-sized silhouette of the remote participant is projected on the interface, which resembles a mattress standing against a wall. This silhouette or shadow is a transformed video stream of the remote site. In addition, the player's own shadow is also displayed, in a different shade of grey. These shadows appear to be created by a light source behind the players, i.e. if the players get closer to the interaction area, their shadows increase in size. If the players face the interaction surface, it appears as if the other person is standing next to them, because the

shadows show the silhouettes of two people. Once the game starts, both players try to execute an impact on each other's shadow. Players can punch, kick, or throw their entire bodies against their projected opponent, and the system recognizes when there has been a hit or a miss. Players can dodge hits by ducking or moving out of the way, just as in traditional contact sports. More points are scored by hitting the opponent harder. The players can also talk to and hear each other through a voice connection between the locations. At the end of a specific time interval, the player with the most points wins.

### *TECHNICAL IMPLEMENTATION*

Each station consists of a specially made impact area, consisting of two layers of foam and several layers of fabric. The foam is protected by a silky soft polyester lingerie fabric because its smoothness was required to minimize friction with the impact cover, which is made of double stitched ripstop material, usually used in parachutes and therefore very strong and durable, while also soft and lightweight. It is non-stretch, which was a requirement for our detection mechanism. Its white colour also reflects the projection well. Our aim was to find a fabric that has a feeling to it that invites touching and getting in contact with.

A wooden frame is glued underneath the foam to hold the two surface fabrics in place, even under tension. To ensure a tight fit, we have sown elastics into the fabric. The impact of the user's body onto the surface is measured by detecting the deformation of the surface area, facilitated by the foam: upon impact, the non-stretch fabric exhibits pulling forces all the way to its sides, where it is held in place by 13 elastic bands, serving as springs. These elastics stretch when an impact occurs, and distribute the force based on the locations of the attachments, forming a grid of 42

impact locations, which we found sufficient considering the size of a fist impact. Attached at either end of the elastic bands are stretch sensors. The sensors behave like variable resistors, the more they are stretched, the higher the resistance. Each sensor is connected to a data acquisition board that measures change in applied voltage via a simple circuitry. The resulting data is analysed with a PC. Peaks above a certain threshold determine the location of the impact, and the height of the peak allows the calculation of the intensity, resulting in a three dimensional impact plane, making it a multitouch surface that can withstand brute force impacts.

### *OTHER WORK ON BRUTE FORCE AND COMPUTERS*

Human computer interaction research has started to investigate physical interactions beyond mouse and keyboard, mainly to support participants' weight loss (for an overview, see<sup>14</sup>). These approaches, however, either measure everyday moderate body movements, such as step-count, or limit the interactions to specific (arm-) movements. Perhaps the earliest example of a networked "Brute Force" interface is the *Telephonic Arm Wrestling*, an arts installation created in 1986<sup>1</sup>. Two players arm-wrestle a mechanical device that measures and applies force across a dedicated phone line. Researchers have investigated the convergence of computing technology and physical activities. Related work derived recently from a CSCW perspective, and the term Computer Supported Cooperative Sports<sup>2</sup> has been coined. To encompass social play, some use Computer Supported Cooperative Play<sup>3</sup>. The Virtual Fitness Center<sup>4</sup> uses exercise bicycles positioned in front of a video screen. The physical movements conducted on the exercise bicycle are used as input to modify the representation of 3D virtual environments from map information. Reversely, the map information affects the pedalling efforts.

Tug-of-War can also support Brute Force; at the New York Hall of Science two teams of high-school students were involved in a tug-of-war 13 miles apart from each other <sup>5</sup>.

### WHAT'S NEXT

We are currently evaluating the game with a wide range of participants playing the game. As some participants pointed out, the aspect of pain, often characteristic to Brute Force, is missing in the game, and we are therefore planning on extending the interactive surface by mounting a conductive fabric atop that can administer electric shocks if a player misses a hit to facilitate more intense and emotionally loaded play due to the more severe consequences of the player's actions. Currently, there is not much risk in terms of personal harm involved in the game, but the addition of electric shocks could change this aspect.

To summarize, *Remote Impact* is a "Sports over a Distance" game that provides a full body contact experience between geographically distant players. The game encourages extreme physical exertion and, unlike traditional games, it recognizes and registers intense brute force. We envision in the future it could allow friends and family members who live apart to engage in a full-body experience together in a playful environment without anybody getting hurt. Teambuilding coaches could use *Remote Impact* to increase the effectiveness of teams that work across continents. Event companies or networking organisations could use the system to break the ice between remote participants and build a sense of connectedness. Health club companies with multiple locations could offer dedicated installations to allow members to work out with their distributed friends in connected gyms. We hope the physical intensity of the game contributes to general fitness and weight loss while at the same time allows socializing and creating new friendships.

### Acknowledgements

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# Augmented reality in daily life: The Magic Mirror

THE season is changing, the days are getting warmer... On a spring afternoon you're out window shopping, looking for new clothes and shoes for the warmer weather.

You're looking for a special pair of shoes for a special occasion, your friend is getting married, but also some comfortable footwear for daily wear.

In the windows new collections of footwear are displayed, many different shapes and colours. Sometimes you like the style, but the colour is wrong, other times it's the opposite. But finally you find a new shoe shop: it sells customized products.

As soon as you enter the shop you can see it's different from the others, there are no boxes around, but more computers and videos. The shop assistant arrives to welcome you.

You explain that you would like to see that pair of shoes that's in the window, but you would like to know if it's possible to have it in black instead of light brown.

The assistant smiles and exclaims, "no problem, here we sell personalized products...! That means you can personalize the model according to your preferences and needs. For example the colour, depending on the dress you want to wear with the shoes, or the occasion. Or again, if you need footwear for outdoors in the winter, you can change the sole and leather."

"WOW!! This is really a good way to have the perfect product for my needs", you are thinking. So in just a few minutes you sit with the shop assistant to design the shoes you need choosing from the range of options available. The shoes in the video seems to be perfect, and now all the information is being sent to the production department, but you want to try-on your shoes to be sure about the product...

In the centre of the shop there's an area with a carpet and some chairs, this is the Magic Mirror area.

"The Magic Mirror is a tool that let you try-on the shoes you've just selected in augmented



CLAUDIA REDAELLI  
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reality," explains the assistant. "It's composed of a screen in which the user can watch himself just like in a mirror. The user wears a special pair of orange socks over his own shoes and the mirror 'reflects' the selected shoes. During the Magic Mirror vision you can even change the features you want to choose and see different models on your feet."

The tool is really amazing and fun, but you want to know more about the system and its components so the assistant explains. Using an interactive digital Catalogue application that runs on a personal computer, the user selects the brand, the model of the shoe and customizes some element of the model, the colour or the finishing details. The model is then loaded into the MM application from a 3D models database and the user tests the virtual shoe on. The system is composed of a

32 inch LCD screen that works as a mirror, a camera that captures the user and send the images to the screen, a tracking system to track the position of the feet of the user with six degrees of freedom (DOF) to digitally superimpose the virtual shoes to the live video. To mix the virtual shoes with the live video, in real-time, a uniform background is used for chromakeying. A PC with the MM application and the Catalogue manages the running of the software. The MM application and the Catalogue can also run on different networked PCs. The real-time graphics module is developed with OpenGL library.

Screens with the digital catalogue application are available around the shop and you can start your selection process by yourself if you feel comfortable. The technological approach seems to be a bit scary for women, but male clients are enthusiastic about selecting and buying shoes by themselves, and in the future even staying at home and using the Internet.

Using new technologies in daily normal activities such as buying footwear can be revolutionary not only for the new approach to customized products, but also in showing people not to be afraid of wearing sensors and experience a new kind of reality.

Something is missing in this new approach; the feeling of the shoe. Another more concrete and mechanical tool has been studied. It's called FootGlove and it's an instrument that gives the sensation of the specific model you've selected. In a future, the orange socks will be substituted by the FootGlove and the comfort/feeling and aesthetics will be experienced together.

# Can movement be virtual?

JIN MOEN PHD

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**A** movement can be literal, abstract, or abstracted (Blom and Chaplin, 1988). Can a movement also be virtual?

According to the dictionary, *virtual* means "almost or nearly as described, but not completely or according to strict definition". Or when it comes to computing, virtual means "not physically existing as such but made by software to appear to do so".

In this text I will discuss movement as means of communication and interaction, from a people-centred perspective. How do we as humans experience movement? My findings are based on people's own descriptions and narratives of how they perform and perceive movement as well as my observations as dance teacher.

When people communicate we use all our senses in order to create a meaning out of what we perceive. What does she say? Why does he look like that? What is that smell? Where did that sound come from? Why is this so sticky? We often talk about the five senses. However, there is another sense that we do not talk about that often, and that is the kinaesthetic sense, also known as kinaesthetic perception or kinaesthesia.

The kinaesthetic sense is part of the human haptic system. Haptics or haptic perception could be described as what we can perceive through the sense of touch, in the same fashion that optics is what we perceive through the sense of vision. Haptic perception is separated into tactile and kinaesthetic perception. Tactile

information is what we perceive through nerve cells in our skin. Kinaesthetic perception is based on information from muscles, tendons and joints, and therefore it is triggered by physical movement.

The haptic system is the only perceptive system that is bilateral. In all human movement the bilateral aspect is of great importance. The kinaesthetic sense provides us with feedback and information about where the different body parts are located in relation to each other, and thus an ability to control our body movements. In other words, it makes the body able to communicate with and within itself.

The importance of the kinaesthetic sense is often neglected or put in the shadow of more apparent senses like vision and hearing. However, the kinaesthetic sense is tightly connected and intertwined with the other senses. When we watch movements the process of kinaesthetic memory works reversely, from (visual) image to muscle memory. People who are trained and skilled in specific types of movement patterns, e.g. dancers and athletes, do not have to physically see the movement in order to cause physical changes in their muscles. They have developed an ability to imagine anatomically and physically correct movement paths without actually moving, making use of their kinaesthetic sense and bodily memory.

"A kinaesthetic memory flares in our moving muscles; triggered by a movement we are doing, it recalls other times of movement. ... The memory is caught in the preconscious, in

the sensing organs, and in the muscles. ... This phenomenon, known as muscle memory, allows memory, images, and meaning to be encoded in our muscles." (Blom and Chaplin, 1988)

So, when we see someone or something that moves, we immediately and often unconsciously, search our movement memory in order to understand what is happening. We try to find the meaning of the movement. Hence, movements are always mediated or sensed through our physical body or felt (emotionally and physically) through our bodily memory. We can sense our own bodily movement through our physical body, but we can also physically experience movements that are being performed by others, both by humans and machines.



Various artworks that make use of machines as dancers (*The Lamentations of Orpheus*, *The Forklift Ballet*) are very good examples of how we ascribe human abilities, emotions and expressions to things that move. Movement is what we use as an indication that something is alive. When it does not longer move, i.e. is still, it is dead.

A movement can always be discussed from two perspectives – from the performer or the mover's perspective, and from the observer or viewer's perspective. This also means that an objectively observed movement can have two different meanings – one for the performer and one for the observer. However, when we discuss virtual movements it is most interesting to talk about the observer's perspective. A movement is rarely to be experienced as virtual from a performer's perspective. Even though the mover is only imaging or visualising the movement mentally and not fully performing it, the performer can still be able to physically sense it.

The creation of meaning from a movement observer's point of view is related to his or her previously experience of physically creating and forming movement phrases. The knowledge in and of the different building blocks and elements of movement makes one able to distinguish different kinds of movements and movement themes from each other. The meaning of movement is therefore related to the possibility and ability to recognise movements and movement concepts that are similar to movements one has tried out or explored one self.

Our western culture is often called a visual culture meaning that we base our expressions and impressions on visual perceptions. This might be one of the reasons why there is a

growing interest in bodily experiences and how we can use the full potential of the human body for communication and interaction.

Today, we find oversized screens and displays all over: at work, at home and in public spaces. We perceive so many visual impressions per day that we tend to depend on visual feedback in order to be assured of our existence. One can draw the parallel to what we can call "the mirror syndrome" in dance education. In dance classes, inexperienced dancers tend to rely only on the visual expression that they see in the mirror when they perform choreography. They do not use the sensuous experience in their bodies when performing the movement, or fully make use of their kinaesthetic sense. They rather use the mirror to check if they are doing the right moves and if they look good. The consequences are that the choreographical expressions become two-dimensional. However, people in general do have a less developed sense for the physical space they take up in the sagittal plane (movements backwards and forwards) than in the horizontal plane (movements from side to side).

Relying on the mirror or the screen also puts the focus away from the personal sphere or the physical space of interaction, towards a projected area on a specific distance from the body. Watching people playing physical video games, such as *Dance Dance Revolution*, *EyeToy* or *Wii*, they have their focus outside their bodies, at or towards the screen. It is only when the avatar or their actions in the game do not correspond to what they think they are doing, that they tend to check their own bodies – by looking at it. For example when playing dance-mat games people look down on their feet in order to check if they are placed on the right button or not. Or when playing guitar games, they look at their fingers in order

to check if they are placed on the right buttons. It is only when you are a skilled player that you can feel if they are badly placed, i.e. they are using their kinaesthetic sense that they have trained in that specific context.

It is time to get back to the question I posed in the beginning of this text – Can a movement also be virtual (in addition to literal, abstract and abstracted)? As I have already pointed out, from my point of view, the movement is always "real" from the mover or performer's perspective. But what about the observer's perspective? Can we perceive movement as virtual?

Even though movement is performed in a virtual environment, i.e. we watch an avatar moving on a screen, we will still perceive that action as a movement and start searching our movement memory in order to create a meaning out of what we see. We can still have a physical sensation of our visual impression, and it can be difficult to actually separate "real" experiences from "virtual" ones.

Movement is a very subtle action and people are very skilled in perceiving small and almost unnoticeable changes. Hence, I believe that humans will for still quite a long time, react to and perceive movement on a subtle and immediate level, independently of the origin of the movement, i.e. if it is virtually generated or performed by a person with flesh and blood. However, if the trend towards an increased use of devices that are used for sensing all our physical states in order to inform us about how we are doing, from stress levels to stomach pain, we might lose our ability to make use of our kinaesthetic sense. If we are not trained in using the body as the haptic display it is, we might also start to reduce our ability to perceive movement on an immediate and subtle level.

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- Some of the thoughts discussed in this text are further elaborated in my PhD thesis KinAesthetic Interaction – Designing for the Pleasure of Motion*. *The thesis is downloadable from [www.movementinteraction.com](http://www.movementinteraction.com).*
- The PhD project resulted in a physical prototype called BodyBug, a wearable motion-based interaction concept that triggers people to move. BodyBug will be introduced by the company Movinto Fun AB as a commercial product probably by the end of 2008. [www.bodybug.se](http://www.bodybug.se).*

# We Are All Stelarc's Now

**S**TELARC is one of the most celebrated and notorious artists in the world working within technology and the visual arts. He is both an artist and performer, using his body as medium and exhibition space. Working at the interface between the body and the machine, he employs virtual reality, robotics, medical instruments, prosthetics, the Internet and biotechnology. Stelarc's projects includes *Third Hand*, a grasping and wrist rotating mechanism with a rudimentary sense of touch that is attached to the artist and activated by EMG from other bodies areas; *Amplified Body*, in which the artist performs acoustically with his brainwaves, muscles, pulse and blood flow signals; *Stomach Sculpture*, a device inserted into the artist's stomach and presented through video; and the *Extended Ear*, a work in progress where the artists is having an ear surgically constructed on his arm. The idea will be that an implanted microphone, connected to a bluetooth transmitter will enable the ear to be internet connected in any wifi hotspot, allowing people in other places to hear what the ear is listening to...

*Stelarc – The Monograph* is the first comprehensive study of Stelarc's work in over thirty years and includes William Gibson's account of his meetings with Stelarc and conversation between Stelarc and the editor Marquand Smith. Together all contributors provide the reader with a multiplicity of ways to think about Stelarc.

*Stelarc – The Monograph*

*Edited by Marquand Smith,*  
*MIT Press (2007),*  
*ISBN-10: 0262695607*



## Presence:

*What's hot & what's not*

### Hot

**Challenges:** everybody loves them and a free iPod too

**FP7 Proposals:** do you want to be in my gang?

**Lo-fi Presence:** all you need is a mobile and a laptop, honest

**The Body:** buffed and toned obviously, just like my avatar.

**The Environment:** it's the stuff that surrounds us

### Not

**Definitions:** hard, soft – Presence is the one place where it doesn't really matter

**Social Presence:** Facebook fatigue finally begins to kick in

**Talking Avatars:** my speech bubble says that I am urbane, articulate and sophisticated

**Second Life:** it's the summer, step away from the keyboard

**Collaboratories:** made up word, smell the desperation

# Presence

## in the news

*CITY SPACES CARRY DIFFERENT MEANINGS TO DIFFERENT PEOPLE, AND THEY CHANGE THEIR CHARACTER AT NIGHT. WRITER KATE PULLINGER DESCRIBES HER FEELINGS ABOUT LONDON AT NIGHT.*

“How could anyone not love London late at night, or early in the morning? How could the wide black Thames with the city reflected upon it not remind you of everything that is most desirable and glamorous in life?”

But sinister, too, of course, and this is part of what makes the city at night such a grown-up, adult, provocative space. There are parts of town that always have been, and always will be, creepy. In London: the backend of Whitechapel. Stockwell on a rainy night. Acton when you're a bit lost. And Hampstead, because everyone there seems to go to bed very early.”

*THE GUARDIAN:*

<http://www.guardian.co.uk/politics/2008/jan/22/uk.uk>

*AUTHOR WILL SELF'S NEW BOOK PSYCHOGEOGRAPHY CONCERNS ITSELF WITH THE VEXED RELATIONSHIP BETWEEN PSYCHE AND PLACE IN A GLOBALISED WORLD.*

“To ease this inner friction, Self turned to psychogeography, a practice exploring the interaction of place, memory and identity developed by French philosopher Guy Debord in 1955. Specifically, he decided to walk from his home in London to his mother's city, New York. So it's a walk from Stockwell to Heathrow, and from JFK to Manhattan. By reconnecting these hinterland airplexes with the urban core, Self is making a conscious effort to overcome the hyperdeflation of distance that motorised travel and mass flight has caused. His long essay, “Walking to New York”, forms the intellectual ballast of Psychogeography; the rest of it is a collection of Self's columns for the Independent. If there is a theme, it is this effort to master the disorientating effect of modern mobility, an interconnectedness in our society that has had the paradoxical affect of alienating us.”

*REVIEW IN ICON MAGAZINE:*

[http://www.iconeye.com/index.php?option=com\\_content&view=article&id=2862](http://www.iconeye.com/index.php?option=com_content&view=article&id=2862)

*CHEF HESTON BLUMENTHAL DISCUSSES THE IMPORTANCE OF MEMORIES, CONTEXT AND EMOTION IN TASTE PERCEPTION AND THE EATING EXPERIENCE. ON WWW.STARCHIEFS.COM*

**“WB: Have you toyed with changing climates in your restaurant?”**

HB: We want to create triggers for response, for example a dish that looks like the sea, with sand and water and everything. We're also working with Sony and iPods to add fitting music to the experience.

For food, I think there are contextual triggers you can use – multi-sensory ones. If you can put somebody in a state of excitement, all of your senses are heightened completely. And actually, the Journal of Neuroscience did an article in December that showed anxiety can lower your sense of sweet by 30 percent and increase your sense of bitterness and acidity by 50-something percent.

**MO: Because of the stress hormones?**

HB: Yeah, I suppose it's a defense mechanism. You want to get people excited. But also, that's the reason why things taste better when you're on holiday. You're in a different culture and you're on holiday, so you're less likely to have the day-to-day stresses. And if you think of the most memorable meals you've ever had, guaranteed half of them – the food will be good – but it'll be the company, the occasion, and all the other things there to put you in that condition. So it's a psychological-physiological mix.”

[http://www.starchefs.com/features/heston/html/interview\\_h\\_blumenthal.shtml](http://www.starchefs.com/features/heston/html/interview_h_blumenthal.shtml)

## *Erollicking with Phantoms*

# Illusion in Mixed Reality

ALEX DAVIES

**D**ISLOCATION is a gallery-based interactive installation in which realtime video, audio and audience locational data are employed to create the illusion of additional characters inhabiting the installation space.

Over the last few decades there has been considerable activity in the fields of mixed, virtual and augmented reality research both in visual and aural implementations. Grau's examination of the field in *Virtual Art* indicates that there is a tendency towards immersing the viewers within the virtual world with a suggestive impression of 'immersing oneself in the image space, moving and acting there in 'real time' and intervening creatively'. These systems transport the user into an artificial realm distinctly removed from reality, or overlay artificial imagery over real physical space. By contrast *Dislocation* brings the virtual elements seamlessly into the physical reality of the participants, rather than transporting the audience into the virtual. In this sense the virtual and the real become indistinguishable. Although works such as Nigel Helyer's *Sonic Landscapes* examine this approach in aural form, there has been little development in integrated audio-visual systems. This shift of focus presents particular demands and challenges. How can such an illusion be successfully achieved? What is the significance of this shift in audience experience? Can the

transition of virtual characters into the real world be used as a powerful and compelling emotional tool?

### *ILLUSION*

There are two distinct forms of illusion that can be applied to create a fusion of the real and virtual. The first is evident in cinema and theatre whereby the audience, through suspension of disbelief, can validate the presence of a fantastical creature inhabiting the same space as a human. Although the viewer is immersed within this fantasy world, this form of illusion takes place on a separate plane to the audience's lived reality. Many models of interactive systems that rely on suspension of disbelief for immersion to occur, such as Char Davies' *Osmose* and CAVE based VR also operate within screen space rather than reality. *Dislocation* does not work with such cinematic or theatrical techniques as the phantoms not only infiltrate the participant's world but do so unexpectedly. This has more in common with the second form of illusion; that used in stage magic, whereby the audience is involuntarily made to believe in the impossible inhabiting physical reality. In order to bring phantoms into the real world of the audience, the element of surprise is critical as Lokuage states:

The notion of willing suspension of disbelief applicable to theatrical performances is not apt



in creating illusions. Since magic inherently relies on violating peoples expectation, asking audiences to willingly succumb to the effect of the illusion is purposeless (Lokuge 1995)

By violating expectations, destabilizing moments can be created in which viewers involuntarily exist within a hybrid world of physical reality and illusion

### ***DISLOCATION – INSTALLATION STRUCTURE***

The exhibition space itself is empty, apart from the small inset screens at the front of the room (portals). Concealed from the participants, a camera is embedded in the rear wall, and an array of eight speakers is mounted within the walls around the floor of the room.

The empty room is composed to create a feeling of normality, without any preconceptions of what may occur. As a counterpoint to the visual minimalism, an eight channel audio composition is presented in the room enveloping the audience. Over 100 phantom scenarios are available to inhabit the room with the audience via the portals and surrounding audio system. Lizzie Muller provides an overview of audience experience: “In Alex Davies’s Dislocation, four small mounted monitors are set back in one wall of an enclosed installation space. You need to approach them closely to see what they are showing. It takes a moment to realise that what you can see is your own back, and those of your neighbours peering at the adjacent monitors. The screen flickers slightly, as if there is a minor disruption in transmission, and someone else enters the gallery, nearer to the camera, talking on a mobile phone. The sense of their presence behind you is spine-tinglingly palpable, as is the illicit feeling that you are eavesdropping on their conversation. But glance over your shoulder and you find the room is empty. The other presence was a phantom, a ghost in the machine.”

### ***DESIGN CONSIDERATIONS***

In order for the work to succeed a number of factors had to be addressed.

- Create a seamless illusionary environment that looked and sounded real.
- Control the audience within this environment for the illusion to succeed and be sustained.
- Inhabit this environment with suitable virtual characters and scenarios that could produce pronounced emotional responses within the audience.

### ***VISUAL SYSTEMS***

All aspects of the environment were designed to lead the viewers into particular situations, without conveying the feeling of being obviously manipulated. This subtle influence was utilized to instill in the viewer a sense of freedom within the space, reducing any sense of abnormality in the environment with the aim of enhancing the illusionary impact. If the audience has the impression that they are being manipulated then they will be more guarded and wary and not as susceptible or responsive to the illusion.

The entrance was closely situated to the front of the room to encourage users to move directly to the portals, the prominent focus of attention within the minimal room.

The portals themselves were positioned beneath eye height and set back from the wall so that to view the screens properly, the audience had to move quite close to the portals and lean forward. This provided two benefits. It further controlled the location of the live audience within the room and additionally, by making the audience peer directly into the portals at such a close proximity, removed much of the individual’s peripheral vision. To this end, the portals acted as the viewer’s only visual reference on reality within their surrounds thus immersing them further into the mixed reality they inhabited.

### ***AURAL SYSTEMS***

Sound is a powerfully emotive tool and particularly well suited to the creation of illusion. Sound is a pivotal aspect in *Dislocation* on two levels. Firstly it sets the overall ambience and secondly it is used as a device to heighten the sense of the visual illusion that the viewer is experiencing. Multi channel atmospheric sound was used to create a low level of tension within the room and broadly shape the audience’s initial emotional state. The ambient base also facilitated blending of the live and phantom sounds within the room, acting as an intermediary acoustic zone that both worlds fluidly shifted between.

Sound design techniques from conventional cinema such as off screen sound were applied to the world of mixed reality installation. The presence of the phantoms could be heard prior to their entry into the room, just as one would perceive the impending entrance of a live audience member. These initial spatial audio cues were utilized to setup the forthcoming visual illusion that was about to unfold. Upon visible entry into the environment, sounds generated by the phantoms were spatialised via the eight channel speaker array so that virtual footsteps would move around the room in conjunction with the phantoms movements, mobile phones rang next to you as the phantom reached for their phone and shrieks, laughs, barks and kisses all spatially drifted around with their virtual counterparts.

### ***VIRTUAL PRESENCE***

The framework of the system permitted a nearly limitless array of possibilities for the development of the hybrid phantom presence. Given that human beings respond strongly to the presence and behavior of other humans in their immediate surroundings, developing an illusion of the presence of others was a powerful way of engendering emotional reactions in the participants. Emotional response could have been achieved via other

means such as architectural changes to the space or even abstraction of the environment, but the ability of humans to readily connect with other humans (both real and virtual) appeared to be a logical starting point for these investigations.

A number of video sequences of virtual characters appearing in the space were developed to explore the potential resonance between the live subject and the virtual characters. Beyond the successful implementation of illusion, the choice of scenarios was the next most critical decision. Several broad categories of emotion were considered as starting points for the scenario development. These encompassed curiosity, discomfort, happiness, confusion, and fear and were manifested through over 100 pre recorded video sequences.

Two subsets of phantom interactions were developed with an aim of evoking these responses in the audience. These took the form of passive and active interactions. Passive activities included phantoms simply inhabiting the same environment as the viewer, a virtual gallery visitor passing through or a transient conversation between two phantoms. Active interactions were based around direct connections with specific audience members. For instance, if an individual was located at portal number one, a phantom would enter and precede to address the viewer, begging for money, whispering to them, or being aggressive and physically threatening. These virtual entities were critical to forming the substance of the hybrid world. They not only provided the initial perceptual shift but also sustained audience engagement through emotionally compelling situations and the construction of narratives.

### *ILLUSION ON A SHOESTRING*

Dislocation was developed with consumer grade technologies and programmed within Max/MSP. In order for the illusion to succeed

the phantom overlay had to mimic the quality of the CCTV video feed being transmitted to the portals that served the function of the viewer's reality. The compositing solution was achieved by the use of Chroma Keying. Actors were videoed within a green cyclorama and digitally separated from their background, ready to be composited within the live exhibition space. As the aim of the work was to create the most realistic and compelling illusion possible, approximately 130 scenarios and permutations were recorded that were tailored to various audience situations within the exhibition space. A database and tracking system was then used to present the most appropriate scenarios for a given audience.

### *HUMAN INTERACTION IN A WORLD OF ILLUSION*

Dislocation, much like many practical investigations in the field was primarily developed in a speculative mode informed by prior research experience. The public experimental phase of the research was undertaken in presentations at Experimenta Vanishing Point, Blackbox Melbourne 2005 and Experimenta Under the Radar, FACT, Liverpool UK 2006. During these presentations audience behavior within the installation was recorded to video and provides the basis for the following observations. The first and most basic form of interaction is that of the viewer interacting with their own reflection, their presence in the screens. Even in the absence of any manipulation of the image, viewers found this in itself compelling enough. This was accentuated in the case of multiple individuals being present at a given time as will be examined later. Although this perceptual shift provided within the video system was incidental, it informs the subsequent interactions the viewer has with the phantoms. Some users report that this rear perspective of their environment was in itself uneasy and disconcerting, thus placing the

viewer in receptive a psychological state for the forthcoming phantom arrivals.

### *HUMAN AND VIRTUAL PRESENCE*

The second layer of interaction inherent in the work is that of the viewer and the phantom presences in the space. This takes several forms. Initially there is a fleeting moment when seeing a phantom inhabit the space, and hearing their movements within the room, that illusion becomes reality.

Observation of user responses indicate a significant proportion of individuals doing a 'double take' at this moment, looking in the portals, turning around to clarify their reference of reality and then returning their gaze to the portals to verify what they think they perceived. An interesting twist on this moment took the form of triple takes whereby a phantom would enter, the viewer would establish that they were a virtual entity within the space and continue to view scenarios as they played out. Another audience member would walk in to the space and the initial viewer would think they were in fact another phantom, only to be ever further astonished to turn around and see a physical form behind them. This blurring of the boundaries between the real and the virtual is the point in which viewers are particularly immersed in the work, their perception consumed by the system.

### *THE UNEXPECTED*

Initially I had envisaged that the more psychologically intense scenarios such as direct violent confrontation with the viewer would have the most significant emotional impact. It became evident that this was often not the case. The scenarios that were surprisingly effective were the passive interactions. These were primarily based upon phantom activities that took place within the space, but often had not direct link to the presence of the individual viewers within the environment. In these instances, scenarios such as virtual

gallery visitors entering and leaving the space, phantoms walking into the space to have their mobile phones ring, and other banal aspects of everyday life provided some of the most pronounced effects of the audience. The sheer normalcy of the situation and reflection of the everyday made the illusion more tangible and potent.

An unusual recurrent theme of audience interaction was alarmingly based upon violence. For a small proportion of the participants, the only form of expression or ability to connect with the virtual presence was limited to kicking and punching the phantoms. This was particularly popular with children who are notorious for assaulting interactive arts. Witnessing adults however, throwing punches at non-confrontational phantoms or kicking their legs back from the portals as the phantoms approached was mildly disturbing. The response was not incited by fear but seemingly out of an inability to connect in any other manner.

#### ***MULTI USER INTERACTION AND SUSTAINED ENGAGEMENT***

A clear distinction became apparent between single user behavior and the behavior of groups. Although the initial illusion achieved the same impact upon individuals and groups, subsequent activity differed considerably. Individuals appeared much more likely to focus on the phantoms, remaining at the portals as the various scenarios unraveled. After the initial disbelief, the work was experienced more like a mutated form of cinema. When two or more individuals were present in the space there was considerably more interaction between virtual phantoms and humans alike. Audience members, mediated through the screen-based environment became more playful and performative. The portals provided a novel medium for viewers to stage their own undertakings. Viewers used the unusual visual perspective to run, jump, dance, kick, hug,

and display nearly every other form of human exchange in between, to the scrupulous eye of the portals. Even in the absence of additional phantom presences, *Dislocation* provided a framework that was unorthodox enough to generate unexpected social interaction.

*Dislocation's* ability to sustain audience interest beyond the primary illusion also lies in the anticipation of what will unfold. Viewers savor the momentary loss of control over the world they inhabit and the charged tension of the unexpected.

#### ***CONCLUSION***

*Dislocation* attempts to create a mixed reality environment in which the virtual world inhabits the viewers' physical reality. By utilising convincing techniques of illusion to distort the perception of individuals, compelling works can be created that encourage sustained user interaction and engagement on several levels. In light of the public presentation outcomes, the work clearly succeeded due to the pronounced and visceral reaction of audience members. Further investigation into the nature of emotional response to virtual human presence in these environments (ie, the unexpected success of the banal and everyday scenarios) would be pertinent for future progress. The phantoms not only provided individual narratives but also gave rise to unexpected social interactions between humans. The surprising ability of these virtual entities to mediate and influence the behaviour of the audience clearly shows scope for further applications that the work initially did not set out to investigate.

Though *Dislocation* succeeded in both looking and sounding real, there was a deficit in the ability of the virtual forms to 'act real'. Due to the use of pre-composed video sequences only a superficial degree of audience interaction is possible. This can be solved by the use of 3D graphics but to the detriment of 'looking real'. Due to the current level of sophistication in

computer technologies, further exploration into methods that provide a higher degree of exchange between realistic video representations and humans is necessary and would extend the potential and depth of mixed reality installations.

*Dislocation* was produced with the assistance of *Experimenta through the New Visions Commissions*.

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# The CyberWalk project

[WWW.CYBERWALK-PROJECT.ORG](http://WWW.CYBERWALK-PROJECT.ORG)

**H**AVE you ever wondered what it would feel like to actually walk through ancient Pompeii as it was before the Vesuvius erupted? In the EU funded CyberWalk project we have developed a revolutionary device that enables you to do just that. What is special about this CyberCarpet is that it allows one to walk endlessly in any direction. Moreover, it responds to the behavior of the user in such a way that walking is as natural as possible. The development of the CyberCarpet was made possible through a joint effort of five leading groups from various European research institutions that combined state of the art scientific knowledge with cutting edge technology to make walking through virtual environments become a reality.

In the last few decennia, Virtual Reality (VR) has come a long way. Virtual environments can now be displayed with photo-realistic graphics and high-fidelity 3D sound and even haptic exploration is possible. What is noticeably lacking, however, is an intuitive way to navigate through these environments. Most commonly, users explore the virtual environment by means of a mouse or joystick. In daily life, our most natural way of moving through the world is to walk. Although walking through VR is possible for small scale environments, it is at present still almost impossible to walk through large virtual environments, such as cities.

In the CyberWalk research project, initiated in 2005, five groups from leading

European research institutes developed an omnidirectional treadmill setup that allows for unconstrained walking in any direction through large scale virtual environments. Central features are a markerless tracking system for registering the position of the user on the treadmill and a control system that allows for natural walking while at the same time ensuring that the user stays on the treadmill. The new device, called CyberCarpet, will make it possible for architects and their customers to walk through new buildings even before they have been built. Firemen can practice dangerous scenarios without risk of getting hurt. The system will also have applications in the medical field, for instance for rehabilitation training after a stroke, and in edutainment. Last, but not least, it creates

exciting new possibilities for biomechanical and psychophysical research.

## *THE CYBERCARPET*

The CyberCarpet is an integrated setup of treadmill, tracking system, treadmill control and visualization. The actual treadmill has been designed and built by the Applied Mechanics group of the Technical University in Munich. It consists of a large number of belts mounted on a big chain. The chain moves in one direction, while the belts run in the perpendicular direction. Together, they enable motion in any direction in the horizontal plane. The treadmill incorporates several new mechanical solutions, which ensure smooth and safe operation. The position of the user on the treadmill is registered by a markerless,





image-based tracking system, developed by the Computer Vision group at the Swiss Federal Institute of Technology in Zürich. This way, users do not need to wear special suits with reflective markers, as normally used for optical tracking. In addition, the tracking system is able to extract the posture of the user from the camera images independent from the user's current orientation. The extracted poses can be used to interact with the virtual environment. The registered position of the user is used to control the velocity of the treadmill. The

Robotics group at the University of Rome 'La Sapienza' developed a control algorithm that determines the response of the treadmill to the behavior of the user. As a result, the accelerations that are imposed on the user are kept as low as possible, allowing for normal walking behavior, while at the same time keeping the user within the boundaries of the treadmill. The algorithm is based on scientific knowledge concerning perceptual and biomechanical constraints, collected by the Multisensory Perception and Action group

at the Max Planck Institute for Biological Cybernetics in Tübingen. It was successfully evaluated with human users. Additionally, the Autonomous Systems group at the TU Munich developed a procedure to evaluate and improve the treadmill control according to optimality criteria.

The showcase of the CyberWalk project will be a complete virtual model of the ancient town of Pompeii as it was before the eruption of the Vesuvius in 79 AD. To this end, the Computer Vision group in Zürich developed the CityEngine. This software package enables the fast creation of large-scale virtual environments, in particular cities, in various degrees of detail. The Pompeii model is based on archeological and historical knowledge of the town.

The entire project has been coordinated by the Max Planck Institute for Biological Cybernetics in Tübingen, with management support from the AFWO Agency for Research Funding, also based in Tübingen.

#### *THE CYBERWALK WORKSHOP*

The integrated CyberCarpet setup was presented to the general and scientific public at the Max Planck Institute for Biological Cybernetics in Tübingen in April 2008. The event was accompanied by a symposium with invited talks and an open poster session, bringing together research on locomotion from a wide spectrum of disciplines. Topics included: perception during walking, engineering of treadmills and other locomotion devices, locomotion and gait research, control theory, virtual reality and visualization.

#### *Acknowledgements*

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# Children, guidebooks, SMS and virtual characters

*JOHN V H BONNER, ANDREW WILSON AND ASRA NARDI*

*LIVE:LAB*

*BLINK*

**T**HIS article explores some of the design and development issues that were taken into consideration during the use the development of a series of 'digitally-augmented' guidebooks for children. The children's interaction with the guidebook was 'augmented' by creating a simple SMS dialogue between children and a fictional character. A number of booklets were produced using a themed-narrative based within a tourist attraction where the main character in the guidebook requests text messages from children. These requests were based on a series of multiple choice questions related to interesting objects that could be found around each attraction.

The aim of the project was to increase children's understanding, interest and engagement at a number of tourist attractions through 'digital augmentation' thus forming a deeper sense of participation and presence through immediate and reactive engagement with a guidebook character. We concludes with important implementation lessons around designing, and very importantly, implementing this form of interactive technology.

This project was part funded by the Institute of Physics (IOP) which was interested in the educational aspects of increasing children's awareness of Physics and its relevance to

everyday life. All of the technical development and implementation of the SMS technology was managed by Blink, a not-for-profit organisation funded through the Design Research Unit at Huddersfield University, and other bodies such as NESTA and The Arts Council. The two independent evaluation studies were carried out by ICT4Learning and Jenesys Associates.

## **BACKGROUND**

Despite considerable advances in interactive technologies, paper remains a very resilient medium for displaying, retaining, annotating and distributing information (Sellen & Harper, 2001). Paper-based and digital technologies have very distinct and separate functional properties and therefore have remained discrete technologies. Research studies have examined how these two media could be brought together, for example by allowing annotations to be made on paper which can be transferred to the digital source document through the use of a digital pen and paper containing an absolute addressing system (Guimbretière, 2003) or by augmenting reading through RFID tagging and electric field sensing devices to trigger audio and graphical information during the reading of an interactive child's book (Back, Cohen, Gold, Harrison, & Minneman, 2001).



These proposals, however, require new bespoke technical support infrastructures in order to merge paper and digital media. Blink's approach was more prosaic by using PC tablets and then subsequently short message service (SMS) or text messaging from mobile phones in conjunction with a guidebook. These technologies were used because of their high level of acceptance amongst young people, as they are an established and ingrained aspect of maintaining social networks (Taylor & Harper, 2002); thus a very simple reciprocal dialogue could be created between the participating children and a virtual character within a guidebook.

## **DEVELOPMENT OF AUGMENTED GUIDEBOOKS**

The development of this interaction style began with the use of PC tablets in a two day project at a Science Adventure Park called Magna in

Rotherham, South Yorkshire. A small group of children, aged nine and ten, were asked to help find and set free genies trapped by Mardi, an evil wizard, in objects around the building using a number of RFID tags which trigger interaction with one of the genies. The children use a 'Magic Mirror' (a tablet PC with an RFID reader). As well as trapping the genies, Mardi has stolen their stories and memories. Children therefore create stories and memories using the tablet PC. The Genie talks to the child through the Magic Mirror, and asks questions about itself and its world. These questions are the missing memories that Mardi has stolen. The children respond by writing and drawing on the Magic Mirror giving the genie new memories. The interaction design of the game was deliberately created to allow the development of a non-linear narrative thus removing the need to follow a pre-defined and designated route. This was, however, unpopular with the parents and teachers responsible for managing and supporting the children through this creative writing experience as they preferred to move and usher children through a logical route through the building. The tablet PCs proved difficult for the children to carry and difficult for the museum to maintain and quickly emerged as an inappropriate mobile device. This practical difficulty forced a review for an alternative and more suitable device. Therefore in the following study, mobile phones were used in preference to the PC tablets. Nevertheless, many of the children's responses to the experience were positive and they reported enjoyment in communicating with the 'genie' character and happily suspended disbelief about its real existence.

This first study provided important interaction design lessons for two subsequent projects that were carried out over the Summer of 2007. One of these studies was funded by the Institute of Physics (IoP) who have been exploring innovative ways of increasing positive public

awareness towards their discipline and have an existing partnership with the Butlins holiday resort group. Using lessons learnt from the previous project, mobile phones were used to create an interactive game. A short booklet was produced with a central character called 'Echo' who visits Earth from a far away planet. Echo is keen to learn about how the planet works and needs information in order to get home for tea! For this project the design of the booklet was improved to ensure that children and parents would quickly engage in the task and quickly understand how to communicate with the character through text messaging. An important feature was ensuring there was adequate distinction between critical instructional and procedural text against background narrative text. Pages were designed to ensure a quick glance at each page would provide key important procedural information.

The selection of the SMS server was also important as it had to provide immediate responses to text messages, which is an uncommon feature for most SMS servers. This was critical as the users of the game needed to gain quick responses to their commands, which were usually single word messages to ease keyword identification. Frequency counts of usage over time were recorded and amalgamated over the three holiday camps used in the study.



Usage patterns were recorded and uptake of the game was initially very high but fell to zero within a few weeks but then picked up towards the end of the holiday period. It appeared that the booklets were handed out in the early weeks, and then forgotten about. With some prompting, the booklets were again promoted to new families at the end of the holiday period. The data revealed the importance of staff support and encouragement to engage with the game and booklet. The game and guidebook were evaluated at two of the three Butlins sites and attracted 65 participants of which 46 completed the game. User interviews were undertaken to assess the effectiveness to communicate and provide a positive experience of physics for the Butlins holiday makers. Interviews related to implementation issues with Butlins staff were also undertaken. Overall uptake of the game as a percentage of potential users was relatively small. It was estimated that around 200 participants would be interested in playing the game but only just over a quarter of this target was achieved. Several reasons were attributed to this, a lack of a coordinated integration with other activities and clear explanation about the game during family induction sessions, little tangible incentive to participate, as rewards for completion were not generally regarded as being worthwhile, and wariness of using texting due to uncertain network costs and some parental concern over their children communicating with an unknown character. Completers of the game generally reported positive experiences of the game and its intended purpose and enjoyed an activity involving the whole family. However retaining interest for the whole family was often difficult, older children found it unchallenging and unsuitable for their own age. Participants were critical of the game when comparing its perceived value against other competing activities in the holiday camp. Some thought exploration through texting, rather than through active experiential learning, lessened

the overall impact of the intended message. Non-completers did not find the game engaging enough and abandoned it due to the lure of other activities, rain, or poor completion incentives. Many of the participants wanted to meet the character and thought this would increase interest and engagement with the game.

At the same time a third study was undertaken at a historical house open to the public – Bantock House near Wolverhampton. In this study, participants had to help a historical character, Will, accomplish some household chores by identifying objects in a number of rooms.

Two family groups volunteered to take part in the observation study and agreed to be shadowed by a researcher while they went through the interactive guide. The first family consisted of a mother and three children aged 10, eight and three. The eldest child was accompanied by one of her friends and the responsibility for reading the text out loud was given to her but the prose proved too lengthy for the others to remain consistently engaged with the task. Age differences between the children created tensions in managing a coordinated journey through the house as they wanted to explore rooms independently. The mother found the structured and interactive learning aspects of the tasks useful as it helped to alleviate responsibility from her to manage the visit. One of the children suggested the introduction of other characters to encourage further visits.

The second family consisted of two parents with their son (aged nine) and twins (aged six). The family did not read the booklet in detail and missed some critical information resulting in them entering the wrong room. Other incidents were reported where assumptions had been made, either by the author of the booklet, or by the family, which resulted in breakdowns in the narrative journey. The booklet did not provide any form of error management and

without the intervention of the researcher the family would probably not have completed the activity.

### CONCLUSIONS

All three studies highlight the importance of understanding appropriate rules of engagement between the interactive SMS game or activity, the host environment, participants and the virtual character. Each element and the relationships between them need to be considered carefully by the interaction designer to ensure a seamless and credible narrative.

Although the findings from the independent evaluation studies focus on the interplay between the guidebook and the virtual character, in a broader context these studies also reveal other competing demands. Tensions often arise between family members in their commitment to engage with the game, natural sibling rivalry and competitiveness suggest that older children will not find the game as engaging or challenging. Therefore games need to be designed with multiple layers of meaning and complexity to suit a broader target age ranges. Within this, there also needs to be a structural framework for parents to assist their children. In contrast, the narrative also needs to be transparent to parents to allow them to encourage their children and help them form structure to the narrative. The three studies also highlight the context in which the game is placed affects attitudes towards engagement. For example, Magna and Bantock House, inherently encourage learning as well as enjoyment, and therefore participants appeared more willing to engage in inquiring activity. However, the Butlins study suggested that families looked for incentives and immediate reward to encourage participation. The studies also revealed how successful adoption is dependent upon the host environment providing the correct support in terms of awareness, games rules and boundaries by on-site staff. This was lacking in

all the case studies. It is likely the games would have been more successful if it was possible to review progress both through staff support and appropriate external or spatial signposting. This would enable families to ensure they are on the right track and aid repair when inevitable breakdowns in the narrative occur. Character design and behaviour is also important. Perhaps one of the mistakes made was the use of literal cartoon representations within the guidebooks which then implicitly defines the character's behaviour. The use of more abstract descriptions might improve the characters' credibility value over a wider age range of children.

Designing compelling user experiences even for a relatively simple SMS dialogue described in these studies nicely exhibits the broad nature of interaction design; it requires an elusive mix of virtual and tangible encounters which also purposefully weave a credible and engaging narrative.

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*Photos from Magna study*

# Presence: Present and Future Markets

*the PEACH Industry Event*  
12-13 November 2008, Turin, Italy

THE Peach Industry Event is a conference and an exhibition where companies, researchers, investors, public officials and entrepreneurs gather to learn, to see, to touch, to discuss and to network around solutions, products, services and more based on Presence technologies. We aim to foster the contact of researchers with market actors in the industry, in order to assess future market trends and opportunities. Involving commercial players in the early development stages of a new field is conducive to the efficient development of future relevant technologies and enhancing market receptivity. Presence Research focuses on improving the quality of experience with virtual, mixed and augmented reality systems, with applications in several areas.

The Industry Event is co-located with the VIEW 9 Conference - Digital Convergence, which will be held from Tuesday 11 to Friday 14 November 2008 and which is an international event focusing on Computer Graphics and covering Digital Cinema, Automotive Design, Virtual Reality, 3D Animation & VFX, Architecture & Design and Games. This synergy creates an opportunity to access to even more contributions and to dive into a critical mass of mixed experts, business men and students.

<http://industry.peachbit.org/>

# Events

# Presence: Technologies and Applications

*2nd PEACH Summer School*  
9-11 July 2008, Dubrovnik, Croatia

SUMMER Workshops are proven to be an effective tool to encourage students, young and senior researches to create new research communities. Two summer schools, each lasting 3 days, are organized by Peach with the support from the European FET program Presence II Integrated Projects (IPs).

Following the success of the first summer school held in July 2007 in Santorini, Greece, the second Peach summer school will focus in particular on applications of Presence. We aim to bring together researchers and practitioners from many academic disciplines and industry and stimulate cross disciplinary activities involving presence research and application. European projects FET Presence I & II will provide the conceptual backbone for discussion between researchers scattered across groups worldwide. Many key researchers and practitioners have already expressed their willingness to participate. Therefore, the event is an excellent opportunity to foster Peach objectives, since it is expected that many members of the Presence Community will be present, as well as others not fully aware of the relation of their work with this scientific field.

The fundamental objectives of the Summer School are to:

- promote the Public Understanding of Presence research,*
- foster Market interaction,*
- establish stable links with Industry players,*
- share knowledge and vision future research areas,*
- discuss Landscape and Roadmaps for future Presence research.*

The instructional level of the school will be appropriate to Master and PhD students, and Presence researchers & experts.

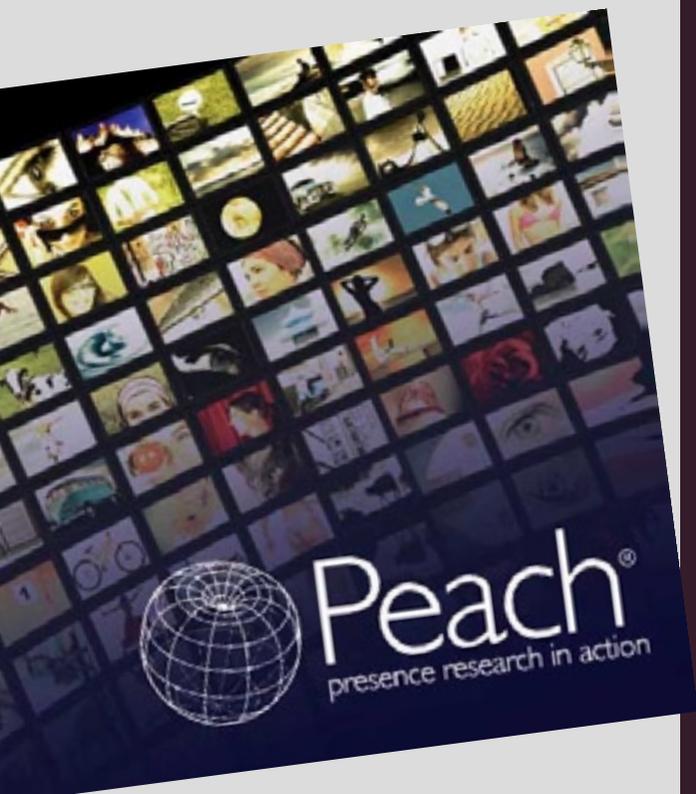
<http://school.peachbit.org/>

# Fragments of Place

As part of the Peach project's remit to increase public awareness of Presence research an exhibition will take place at this year's Edinburgh Festival Fringe. Members of Napier University will exhibit an interactive new media art installation that explores how the sharing of images, normally hidden on mobile phones, can reveal more about people's sense of place and the nature of this ultimately shared experience.

The exhibition will run from 3-25 August, 2008 and will be located at the GRV, 37 Guthrie Street, Edinburgh, UK.

[www.fragmentsofplace.org](http://www.fragmentsofplace.org)



# Events

## Psychology Journal

### SPECIAL ISSUE ON MIXED REALITIES IN THE URBAN ENVIRONMENT

URBAN mixed realities represent a growing and exciting area of research, which requires new ways of thinking about issues such as usability, place and presence. Urban situations are dynamic and can change rapidly, with a vast array of complex and exciting rhythms. They cover a whole spectrum of complex and chaotic happenings which span organisational and material configurations. These characteristics are both challenges and motivations for exploring mixed reality technology solutions, in particular with respect to finding methods to improve the ways in which participants can relate to the environment and to others. Mixed realities cover all situations in which digital objects are combined with physical features of the environment. Technologies include pervasive, ubiquitous, multimodal, and augmented reality solutions. Current projects explore and evaluate forms of interaction and presence in urban environments which use mixed reality technologies to improve or create new practices. This can be achieved in two ways: either by augmenting the engagement with others (including encounters, feelings, exchanges, co-experiences) or through augmenting the engagement with the environment (places, or things), which includes playing, understanding and interpreting the environment in new ways. We invite designers, technology developers, social scientists, psychologists and urbanists to submit a paper. Topic areas include but are not limited to:

- The role of the urban environment in shaping content and technologies
- Interaction issues within urban environments

- Frameworks and theories: place, presence, co-operative systems and cognition
- Technologies: from mobile phones to head-mounted displays
- Design and evaluation methodologies
- The role of art and performance in urban mixed realities
- Personal and societal issues related to the use and deployment of urban mixed reality systems
- Applications of urban mixed reality technologies: games, cultural heritage, emergency response training, pervasive games, social networking etc.

Case studies, applications, and theoretical contributions are all welcomed however they should all be focussed on mixed realities and the urban environment and be scientifically sound. The precise formatting guidelines and other relevant information for authors are available at:

[www.psychology.org/255.php](http://www.psychology.org/255.php)

#### IMPORTANT DATES:

Submission Deadline 30th May 2008

Notification of Acceptance 20th June 2008

Final Copy due 15th July 2008

#### GUEST EDITORS:

Rod McCall, *Fraunhofer FIT, Germany*

Giulio Jacucci, *Helsinki Institute for Information Technology, Finland*

Wolfgang Broll, *Fraunhofer FIT, Germany*

## Postcards from Presence 2007, Barcelona



*CAROLINE NEVEJAN,  
AMSTERDAM*

*WHAT DO YOU DO?*

I make things happen... I have been involved in Mediated Presence from the 80s. Always in my work there is a social agenda and the thrill of the technology and the design it makes possible. I ask myself what is this stuff for and does it really help people? Human dignity and respect for complexity I also find that very important.

*WHAT INSPIRES YOU?*

Beauty, especially beauty in process when you see someone get happy or when you see a child learn, change perspective...

*WHAT IS YOUR MEMORY OF PRESENCE 2007?*

Presence research together with climate change is the big issue, it has that level of urgency – its how we do our democracies and do our business. Presence is super crucial and I don't feel that sense of urgency here. Points of references at the conference are too minimal, while I really like the work that is being carried out I also miss the sense making.



*DAVID NUNEZ,  
LECTURER AND RESEARCHER, UNIVERSITY  
OF CAPE TOWN, S. AFRICA*

*WHAT DO YOU DO?*

What I have been looking at for about six years now has been Presence and specifically looking at the role of Human Information Process in Presence.

*WHAT INSPIRES YOU?*

Just curiosity. I have always been a keen game player and that started me looking at priming - how the things that happen before you get into the VE might actually change the way you feel when you are there. Now I have moved into the content area – what you know might change your experience. What does that do to your experience, does it make it better or worse?

*WHAT IS YOUR MEMORY OF PRESENCE 2007?*

There is a sign of maturity here, we have finally passed debating endlessly about definitions. There is a language now that we understand. Also what is happening out there is catching up with our ideas we are now ideally positioned now to start giving information to the public on things that they need to know.



*ELIAS GIANNOPOULOS,  
ATHENS, GREECE*

*WHAT DO YOU DO?*

I am not really related to the Presence community yet I am hoping to start my PhD this year. I personally am interested in EEG analysis – maybe in the area of dreams and sleep.

*WHAT INSPIRES YOU?*

Actually I think it is very interesting how you can see yourself somewhere and at sometime, the whole essence of being you being there. I have been fascinated by dreams and the state that your mind gets and these sort of states, dream like conditions - being present without physical being somewhere is when you dream, you completely feel certain event or something happening all the emotions you dreamlike state.

*WHAT IS YOUR MEMORY OF PRESENCE 2007?*

I can't really say right now as I am so involved in trying to get into the presence community it is very emotional for me – maybe it's a start for me, my memory will be the beginning of that process.



*DAVID WEIBEL,  
UNIVERSITY OF BERN, SWITZERLAND*

*WHAT DO YOU DO?*

Just finished my PhD three weeks ago – I work at the division of general psychology, media psychology and quantitative methods. I was mainly interested in the question what happens when people get totally immersed into not only VR, whatever this is, but in media.

*WHAT INSPIRES YOU?*

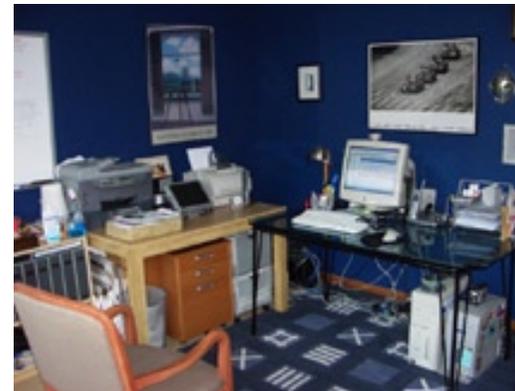
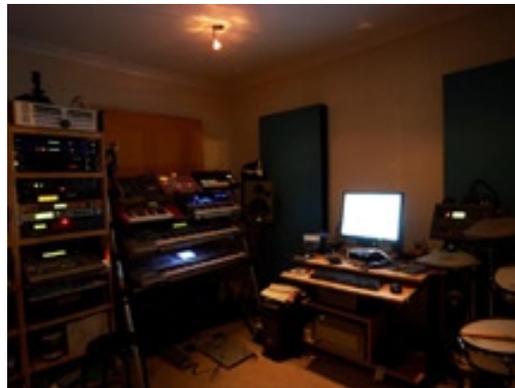
I would like to know what is really going on when people get immersed. What are the processes behind this, so what happens to their attention or what cognitive factors are involved, what about emotion?

*WHAT IS YOUR MEMORY OF PRESENCE 2007?*

The feeling of being up to date, gave me a chance to discuss with people and gave me an impression of what people thought about the concept of presence – some people have the same problems that I had, what presence is and how to measure it.

# Your creative places

In the last issue of Keho we asked you to send in your images of the places where you feel creative



*Thanks to everyone who sent photos, your iTunes vouchers are on their way.*

## *Summer Challenge!*

This issue we are giving away free CAVES for you to carry out your own Presence experiments, liberated from the confines of the lab - see page 40. All we ask in return is that you send us your photos of your CAVES in interesting locations. As an incentive there will be iTunes vouchers for everyone whose photos are published.

Send your photos to [keho@peachbit.org](mailto:keho@peachbit.org)

# Make your own *cut-out-and-keep* Keho CAVE



## CAVE : *noun*

1. A large chamber in the side of a hill, cliff or mountain.
2. A Computer Automatic Virtual Environment is an immersive virtual reality environment that uses projectors to display images on three or four walls and the floor. The name is also a reference to the allegory of the Cave in Plato's Republic where a philosopher contemplates perception, reality and illusion.



**Special Bonus!**  
*FREE Social Presence Actors*  
*conduct your own co-presence experiment.*

## Instructions

1. Cut out the CAVE, taking care not to cut off the tabs.
2. Crease along the dotted lines.
3. Glue tabs under the floor of the CAVE.
4. Cut out the social presence figures.
5. Fold tabs and place figures in the CAVE.
6. Carry out your very own virtual reality experiment.
7. Submit paper to next Presence conference.

