

INTERACTIVE TELEPRESENCE AND TELEMATICS

*Dancing with the Streaming Digital
Body Image*

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Abstract

This paper investigates the interactive relationships between physical and digital bodies in a telematic performance and performative installation arrangement, based on both theoretical and practical research. During the development and presentation of a practice-based project, performers' and spectators' contribution to the creative process and the fusion of a conscious with an illusionary state were observed and analysed using heuristic research methodology. This research includes an improvement of methods that supports embodiment and communication with and through the live transmitted digital body image, where time, space and gravity are central themes.

Keywords

Telepresence, Telematic Dance, Digital Body, Embodiment

In recent times, the 'virtual' space of Internet, created and employed by computer and video technology, has enabled the 'capturing' and 'splitting' of a body image so that it can simultaneously coexist alongside the physical as telepresent in a remote location. On the most basic level, the physical body of the dancer can be perceived as real and material, limited by gravity, anatomical factors, and their 'kinesphere'. Whereas, the digital body, as an image formed by electronic data, may be viewed as immaterial and 'bodiless', and is potentially unlimited in its transformational capacities. This paper investigates performers' engagement with their streaming digital body image, as well as how the spectator can more actively embody their live transmitted digital presence, in telematic dance performance and installation practices, as part of the development and presentation of a practice-based research project, titled *ChatRooms* (2009 - 2010).

Digital Bodies and the Corporeal

Digital bodies are variable, weightless entities comprised, not of concrete units, but of electronic data-bytes and signals based on the binary code, 0/1. Stored in the database of a computer's memory, any combination of binary codes can be manipulated by digital processing so that 2D digital bodies and 'worlds' can be "freely modified by the user" (Manovich, 2001, p. 44) in terms of such things as:

Size, degree of detail, format, color, shape, interactive trajectory, trajectory through space, duration, rhythm, point of view, the presence or absence of particular characters, the development of a plot [etc.]

(Manovich, 2001, p. 44)

Various possibilities in changing and manipulating digital bodies can be pre-programmed into computers, following predetermined sequences, and set up to be triggered as automatic responses to different interventions and interactive stimuli.

Digital, and 'virtual', bodies and images can also be divided into two categories:

1. Figures created by computer graphics/animation software depicting fictitious and imaginary characters and environments existing, for example, in 'virtual reality';
2. Images, 'captured' and relayed in real time by video, of actual people and situations that are, for example, 'telepresent'.

Hence, the digital body is a dematerialised, bodiless figure that can provide a person with 'a likeness' that can either be an imaginary substitute, or an actual 'copy', a digital double, of their corporeal¹ body image. The corporeal body expresses a sense of identity through the

body image representation that can be related to gender, sexuality, race, class, nationality, religion and age or any combination of these elements. Additionally, digital bodies can take on symbolic qualities, for example, they can provide projected body images of real people with a sense of an immaterial essence of being – symbolically and momentarily transforming them into timeless, spirit figures.

Digitized bodies are freer to deal with illusory effects that alter spatial and temporal configurations, and defy or ignore the presence of weight and gravity because they lack the relationship to space that physical bodies have. The physical bodies are limited by gravitational and anatomical factors, and the 'kinesphere' which according to the movement theorist, Rudolph Laban, determining "the natural boundaries of the personal space" that "travels with the body in the general space" (1971, p. 38), shrinks or grows in relation to how open or closed are the physical body's gestures and postures. Ultimately, the nature of being 'inside' and at the centre of one's kinesphere, or personal space, is a key part of being 'embodied'.

Interactive Telepresence and Telematics

All artworks propose a basic level of interaction with spectators through their interpretation of artworks, about which Marcel Duchamp states: "The viewer completes the work of art" (cited in Dixon, 2006, p. 559). However, in digital interactive artwork, interactivity specifically refers to the ability of either the spectator or the performer to activate, affect, or change the artwork in some way with their own action or behavior. In internet or networked interactive environments such as telepresence and online collaborative multi-users platforms, interactor and interactive subject are dislocated (Rubidge, 2000; Birringer, 2008).

A simple application of telepresence used today is Skype software, which allows users to make 'video calls' in real time through the Internet. According to Lev Manovich, "telepresence means presence at a distance" and is a means by which a person can use a digital signal to 'teleport' from "a real remote physical location via a live video image" (2001, p. 165). Moreover, telepresence enables people to not only see and be seen in real-time over distance, but to use their digitised bodily representation and its behaviour to remotely influence or affect others. As Manovich explains:

Telepresence allows the subject to control not just the simulation but reality itself. Telepresence provides the ability to manipulate remotely physical reality in real time through its image. The body of the teleoperator is transmitted, in real time, to another location where it can act on the subject's behalf.

(Manovich, 2001, p. 166-167)

Telecommunication allows two different spaces to be linked together to create a third dematerialized space for communication and interaction. Fundamentally, to be telepresent in virtual space is for a person to be digitally present in that space through networked technologies, and is a real-time extension of their physical presence. This is also the basic condition and structural set-up of the digital performance practice referred to as *telematics*.

Kozel's experiences as a performer in Paul Sermon's seminal work *Telematic Dreaming*² (1992) is revealing for the insights it provides into the range of psychological and emotional connections and disconnections that can be generated by a digital double. What surprised her was that the dislocated, "computerization of human experience" (Kozel, 2007, p. 94) did not necessarily weaken the connection between her physical self and her digital image. Reflecting on a specific circumstance involving her virtual other, she reports: "someone elbowed me hard in the stomach and I doubled over, wondering why since I didn't actually feel it. But I felt something" (Kozel, 2007, p.97). In another case her double experiences a sexual attack, which causes the opposite result, a complete disconnection from her digital self:

The attack caused me to separate my physical self from my virtual self... paralyzed with horror at what they were doing to the woman's body – no longer my body.

(Kozel, 2007, p. 98).

Kozel's experiences and discussion show that a sense of touch, trust, and vulnerability are very much present in telematic interactions, and further highlight some of the ability, mentioned earlier by Manovich, for telepresence to alter and affect reality at a distance through the technological medium of 'a simulation'.

Overall, interactive telepresence involves real-time connections between the physical and digital body. Thus, in the framework of a telematic performance, the performer directly influences and affects the movement of his or her digital body image, which requires a cooperative and co-existing 'double awareness' of their physical body in the stage space, and of their projected body image on the screen. The interaction of the digital body with their 'screen environment', and with the actions of other screen presences, also in turn influences the actions of the physical body. The practice-based research explores the above principles of telepresence in order to develop training methods for participants' somatic awareness of the streaming digital body image and to expand their relationship beyond basic social interactions into more poetic and surreal states and imagery.



Figure 1. *ChatRooms* (2009 - 2010) by Caterini Dinopoulou

ChatRooms project

The practice-based project of this research, *ChatRooms* (fig.1), is a telematic performance and performative installation that use global Internet network and the device of the 'digital double' as form of communication to further explore ways in which spectators and performers could connect and interact within the environment of an artwork. The body images of two performers are captured in real-time simultaneously in different physical locations (England and Greece), the performers then interact with each other by observing and manipulating their superimposed images on a single projection screen. After the performance, a spectator is invited to replace one of the performers and experience the piece on one-to-one basis as an active participant implying interactivity as a significant component of the artwork that facilitates both spectator and performer spontaneous and playful involvement in the creative process.

A telematic sound performance by Dalot (Maria Papadomanolaki), titled *Meditation on an invisible city*, is *ChatRooms'* soundscape. This telematic sound performance is streamed live from a third remote location (New York) including environmental sounds, drones, voice and abstract rhythmical patterns reflects the disembodied, at times truncated and translocal communication between the different transmitters/receivers performing in the piece. An invisible and ethereal bonding of bodies, sounds and images will result in the creation of a utopian environment mediated through technology.

ChatRooms' intention is to allow the spectator to extend their normally 'distanced' and contemplative relationship with conventional performance by enabling them to enter its 'installed', technologically-crafted structure and engage and empathise with it in an actively physical, full-bodied way. In its participatory form, *ChatRooms* is an example of 'a performative installation' which not only invites spectator participation but also implies interactivity as a significant component of the artwork that facilitates both spectator and performer spontaneous and playful involvement in the creative process.

This project's objective is to highlight the co-presence of digital and actual, 'corporeal' bodies in a 'telepresent' arrangement in between virtual network space and physical stage space. This co-presence creates a split focus in the participant between the 'immateriality' of their digital body and the sensations and abilities of their 'material' or physical body. In *ChatRooms* set-up, both digital and 'live' performance, the participants do not stay imprisoned inside the camera frame, as for example in screen-based computer and video art. Because of the interactions with their physical and screen-based presences, those involved are free to move in and out of the camera frame and 'play' in both the stage space and the camera space (that it is projected on screen).

Practice-based Methodology:

ChatRooms is a practice-based research that has followed heuristic methodological processes in which knowledge grows through the investigation of personal experience as well as develops awareness and understanding through what is referred to as a “creative self process” (Moustakas, 1990, p. 9). Implicit in artistic/heuristic systems of research is the ability to remain open and receptive to new impressions and observations, especially in the first phases of development. Tasks are often set by artists/researchers who use heuristic, trial and error methods that intentionally involve uncertainty about the results, with valuable outcomes frequently arising from accidents.

Moustakas (1990) identifies six distinct phases in the heuristic research process that can be mapped across the development and completion of *ChatRooms*' creative journey, these are: *initial engagement*; *immersion*; *incubation*; *illumination*; *explication*; and *creative synthesis*. The following outline of these stages, applied to this project, reveals the extent to which auto-participation (autobiographical participation) and heuristically-based trial and error procedures informed its artistic unfolding and shape:

1st phase / *initial engagement* / Movement Research

The first phase, ‘initial engagement’, began with questions and discussions, directed both to myself as well as to others, regarding the chosen research topic. This led to foundational movement workshops to produce the exercises from which the future development of the choreographic and artistic outcomes might be formed.

2nd phase / *immersion* / Interactive Systems’ Research

In this phase, ‘immersion’, the earlier workshop explorations is taken to further levels of investigation and development. In order to understand the phenomenon of interactivity between physical and digital bodies, various applications of the computer software *Isadora*³ has been explored in relation with dance movement exercises. This phase of the research process also examined notions of time, space, and memory.

3rd phase / *incubation* / Internet Communication

With this phase of the research, incubation, various websites with chat rooms have been experienced as well as computer software such as *Skype*, which personalises internet telecommunication through the use of web cameras. The users perceive the resulting low quality, distorted, digitalised physical body images as a representation of themselves, which enables them to develop ‘face-to-face’ dialogue with others in remote locations. The digital reflection of a user enters the physical space of another user through a computer screen, and in interactive communication, this is repeated by the other person. The mutual engagement of users communicating through the internet with their digital double, keeps their physical body relatively passive in the web cameras’ frame and the digital bodies can not come in contact in any way. Having explored, using *Isadora*, the layering and overlapping of streamed images, the

experience with *Skype* raised questions about the development of the project in telematic directions and networked environments.

4th phase / *illumination* / Movement Training with Digital Technologies
At this phase of a research process, ‘illumination’, has been realized that there was not very much written regarding performers’ training techniques with digital media. Birringer remarks, “interactive performance is focused on aesthetic or sensory experience, rather than the training of new performance techniques, the role of the user or interpreter is a problematic one” (2008, p. 150). Consequently, choreographers that work with new media have to develop their own methods in order to train performer’s awareness of the digital double and related image states.

5th phase / *explication* / Analysis of Research’s Data

The fifth phase of the heuristic model involves analysis that attempts to get to the essence of an experience, collect all the data and components from the research and re-evaluate them in order to decide on and establish central goals. Consequently, the outcomes and the potentials from previous phased are examined for further development of a compositional structure. The digital bodies of the performers were layered in *ChatRooms*’ interactive system and projected onto a single screen. Performers’ physical bodies became active in the camera frame since they could see that their screen selves are touching each other revealing a physical embodiment of the digital body and a combined greater involvement of both body and mind.

6th phase / *creative synthesis* / *Interactive Composition*

With a goal to create a duet involving choreography for a telematic interactive digital environment, and assistance from a focussed range of compositional exercises, commenced the last phase of the heuristic process – ‘creative synthesis’. Beginning with a storyboard to help develop the compositional structure and mix the timing and movement qualities from *Complementary Phrases* (phrases with complementary forms as the performers fill in the negative space of each other creating a puzzle) and *Pedestrian Phrases* (phrases with abstracted everyday movements), also wove in motion-editing functions from *Isadora*’s software as a further choreographic component. Regarding the interaction between the performer and the audience member, a free improvisation develops in response to the performer’s digital double or the spectators could explore one of the following options: a sensorial experience (vision and touch), complementary forms and perspective play through various mirroring postures.

ChatRooms' prototype

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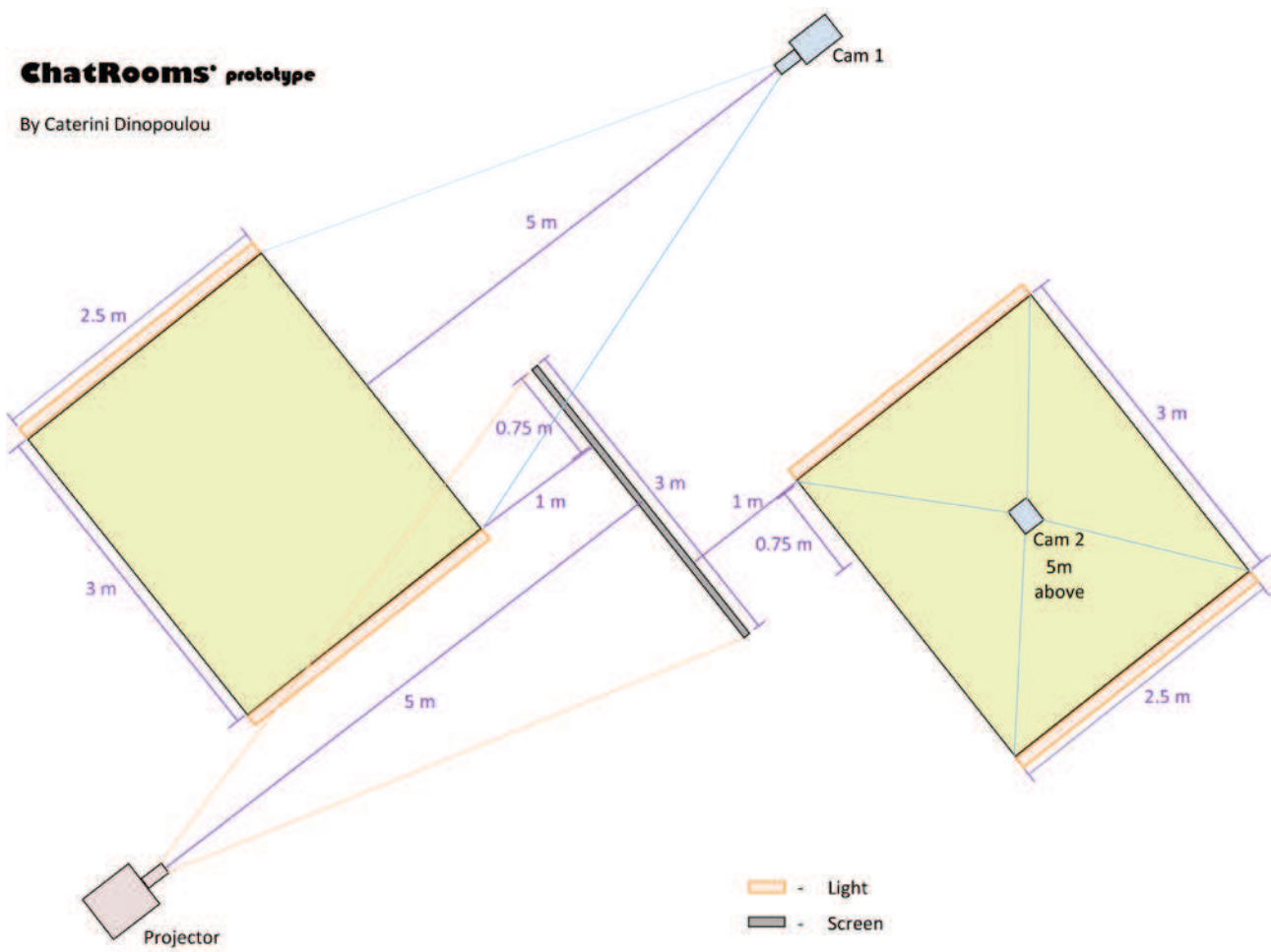


Figure 2. ChatRooms' prototype - technical plan

To summarise: My practice-based research process led me to conceive a project that could be interactive for both performers and spectators. *ChatRooms* is composed of two parts: in the first, the spectator will be an observer of a telematic performance installation involving interaction between two performers (the spectator can enter and leave the performance space at any time as well as is free to wander at any time to different vantage points in order to observe the action from various angles and positions), while in the second, spectator is invited to replace one of the performers and experience the piece on a one-to-one basis as an active participant.

The participant-installation presentation of *ChatRooms* completed the first stage of an ongoing developmental process, and represents a prototype. *ChatRooms* has three stage of development and presentation regarding the location: 1) in a single performance space connecting two solos through a local area network and creating a duet onto the projection screen as it figured at the technical plan (fig.2); 2) in two different spaces in a single venue by streaming in real-time the solos from these two remote location and creating a duet onto the projection screen of each space; 3) in two different spaces in two different venues (cities, countries) by streaming in real-time, through internet network, video transmissions from these remote locations and creating a duet onto the projection screen of each space (fig.3). In this case, a third parallel event also take place collaborating with an interactive sound artist, a telematic sound performance, which acts as the ethereal bridge between the two remote locations of the performers.

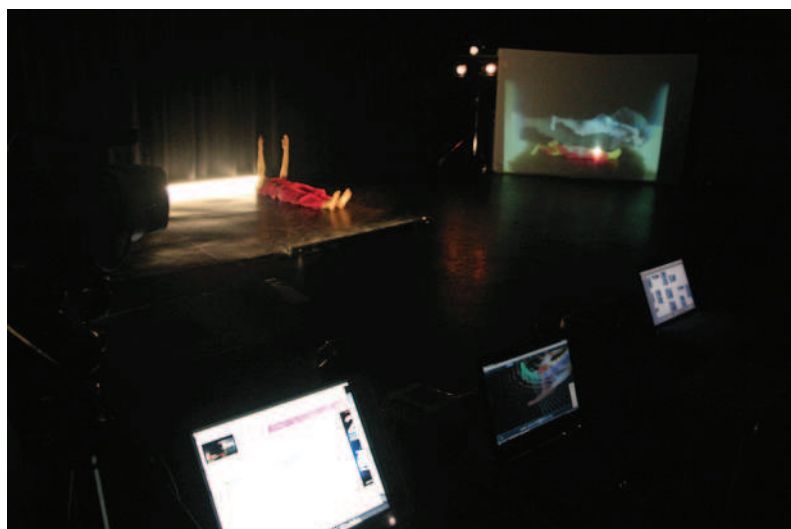


Figure 3. *ChatRooms*
(2009 - 2010) by Caterini Dinopoulou

Venue A: Center of Mediterranean Architecture
(Chania, Greece)

Venue B: University of Chichester
(Chichester, England)

Outcomes and Conclusion

During the presentation of *ChatRooms*, simultaneous presents occur in different spaces, as physical body explore each other through real-time video transmission of digital doubles. However, the live transmissions of video footages that 'moves' forwards and backwards at the remote locations creating a latency, which makes the digital double an echo of the physical body, and instantly a visual memory of a moment now past. The past and the present co-exist since performers and spectators relates to each other using motion qualities of digital softwares such as play, pause, rewind, slow motion creating an extratemporal rhythm. Perhaps this is the closest we may get to actually interacting and dancing with the past.

In *ChatRooms*, the kinesphere of the performer will expand at internet virtual space and then will overlap with the kinesphere of the second performer or spectator on a projection screen. This overlapping could cause a sensory ataxia and an optical illusion because there is not correlation between vision and touch which could become even stronger by layering footages from two different perspectives (above and front). If sensing, according to Laban, is related to weight (1971, p. 127), then sensing through a weightless body affects the perception of gravity and changes the relationship between space and time producing a different kinaesthetic awareness that merging an 'awake' state of consciousness with a dream-like state.

When dancing with digital technologies and a digital double, a performer is not only at the centre of their kinesphere but also 'outside' of it, giving them two perspectives. While performing for a spectator or an audience, they are at the centre of their kinesphere, but they must also be aware of their digital projection and envisage how the camera sees them from its external vantage point. The participants of *ChatRooms* could co-exist and move both as physical and digital bodies, in a physical and virtual space, having the experience not only of the embodiment of the digital double but also the visualization of their existence outside the physical boundaries of the body (disembodied) as observers of their actions.

Endnotes

- 1 Corporeality, in the context of a dance performance, interprets the physical body as personal, social, conscious, unconscious, biological or psychological representation (Preston-Dunlop, 2002).
- 2 Paul Sermon's *Telematic Dreaming* (1992) is relevant to this research which connects two separate locations by using overhead cameras pointing down onto large beds, one placed in each. A performer then lies on a bed, and their image, in real time, is projected onto the surface of the bed in the other location. Spectators are then invited to lie with the performer's image and interact with it. Some other telematic projects relevant to this research are: *Espace Velocity* (1999) by Company in Space, *Versus* (2005) by Ivani Santana and *Sceentouchfeel* (2009) by Body>Data>Space.

- 3 *Isadora* is real-time motion tracking computer software, which allows the physical body to interactively manipulate digital media during a performance or installation. The developer of *Isadora* software is Mark Coniglio, co-founder of Troika Ranch (Troika Ranch website, 2008).

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Biography

Caterini Dinopoulou is a choreographer, interactive video artist and performer working in the field of interactive digital performance and installation both as theorist and practitioner. She presented her productions and lectures at over 30 international festivals and conferences in England, Finland, Cyprus, Turkey, Greece and USA. She delivers workshops on choreography, performance and new media in dance institutes in both England and Greece. She is dance tutor at the Art College of Herakleion (Crete). She presents and directs the television show ArtMagazino (www.facebook.com/Armagazino) at NEA TV of Crete promoting art and culture. She also collaborates with theater companies as choreographer and video artist. Firstly, she studied Journalism at Institute of Professional Journalism (Athens, 1999) and then, a BA in Dance and Visual Art at University of Brighton (2007). Awarded with a scholarship from the Onassis Foundation, she completed a MA in Performance: Dance Maker at the University of Chichester (2009) with a specialisation in Choreography and Interactive New Media. She lives and creates in Crete and is a founding member of Detour Collective, a non-profit association, which aims to merge dance with visual art forms.