

Presence, Interaction and 'data space'

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This paper will examine the concept of 'data space' and sentient 'presence' in relation to practice-based research being pursued by myself and others working in the institutional space that lies between the disciplines of art and science. It will consider the broader Western cultural context for the idea of presence and the contemporary literature produced by presence researchers. The artefacts of three contemporary artists working with presence in the physical spaces of public museums and galleries, will be described in the context of telepresence in the domain of cyberspace

Roy Ascott in the early 1990s described a culture developing in which its creators became part of a complex and widely distributed system. It involved both human and artificial cognition and perception and was 'an art that is emergent from a multiplicity of interactions in data space' (Ascott 1993, 261).

This paper will examine the concept of 'data space' and sentient 'presence' in relation to an art practice being pursued by myself and others working in the institutional space that lies between the disciplines

of art and science. It will consider the broader Western cultural context for the idea of presence, before briefly surveying contemporary literature produced by presence researchers. The third section will move on to evaluate the practice-based research of three contemporary artists in relation to the two topics. Whilst many artists and designers have been developing knowledge of data space and telepresence in the domain of cyberspace, many others have continued working in museums and galleries, presenting in public physical spaces, other kinds of 'multiplicity of interactions in data space'.

1. Presence in Context

The cultural framework into which the notion of telepresence was delivered had already developed a rich set of written and oral language codes around the word presence:

- 'a tangible presence'
- 'establishing a presence'
- 'an eminent presence'
- 'a military presence'
- 'presence of mind'
- 'mindfulness'
- 'déjà vu' (presence already / before / previously experienced)
- 'aura' (Latin – a breeze; invisible essence)
- 'virtual presence'
- 'a microphone presence'
- 'being there'
- 'here and now'

Presence in English-speaking cultures as indicated in this list, is rather more than simply being physically present. Furthermore, in heightened states of consciousness, such as when meditating, the 'here and now' is greatly amplified; or, with the extra-sensory abilities of psychic mediums, the presence of spiritual beings is established, apparently. Presence researchers, largely engaged in engineering presence for the

'virtual environments industry' (Prothero 1995) cautiously maintain: "We are conscious and in an external world", or "...bodily in an externally-existing world...", or "...embodied in an external world..." (Waterworth & Waterworth 2003).

For the artist, the presence of a viewer is assumed – a painter makes adjustments, with decisions about colour, luminosity and mass, maybe also using representational devices like perspective, narrative content etc. to convey an idea, or expression or statement. However, in the words of Herbert Read:

..the basis of the work of art was no longer Nature, but Ideas – something conceptual, geometric, architectural. (Read 1964, 76)

This can make the act of viewing the surface a dynamic experience. Whilst some visual artists like Bridget Riley (Riley 1965) explore retinal response to optical patterning produced at different viewing distances, two-dimensional and three-dimensional artwork which actively responds to the viewer's changing physical position is a relatively recent phenomena emergent from electronic media. How does this affect our understanding, our feeling of presence, of proximity to and participation with(in) an interactive encounter?

The data space in which we move daily and with which we are most familiar is the media flow we have been raised within. It is an accumulation of signifiers - what Derrida termed the absent present :

Signs represent the present in its absence; they take the place of the present ... when the present does not present itself, then we signify, we go through the detour of signs. (Derrida 1973)

Signs go back to an earlier data space. Plato, at the cusp of the wider adoption of the technology of literacy, was concerned to protect the oral tradition of the School of Athens and developed an argument questioning the real value of the new media of the time, reading and writing. As an 'early adopter' of the technology, in the *Phaedras* he

lumps painting and the new technology of writing together, querying them with the observation:

..but if you question them, they maintain a solemn silence. (Plato 1956)

In an oral culture, the presence of the creator of the work is important, for presence allows the pursuit of verification, disputation and debate. In the *Phaedrus*, Plato used the new technology, writing, to preserve the old technology, oratory and *ars memoria*, by reproducing the dialogues of Socrates in a hybrid form, 'the book', a hermeneutic space where an interrogation of the text by the reader could occur. As with any new device, performing tests and trials, comparing the efficacy of its use with the familiarity and pervasiveness of the old methods was a part of a gradual adoption and continuing adaptation during the transition from the old to the new. The new method of literacy remained suspect, as the interpretive space opening between sender and receiver of the text diminished the authority of the speaker, less through the polemicists physical absence but more because of the sharing of the text with others, (fellow readers), who were inhabiting a shared data space. (Ulmer 2002) Literacy, then as now, is as much about remote networking as about coding.

In the context of the data space of cyberculture, of telepresence (or even Ascott's *telenoia* or mind-at-large (Ascott 2003, 259) does the computer-mediated installation in the gallery space develop further opportunities for the expansion of dialogue between the artist/designer, the visitor and the artificial intelligence that lies potentially within the machine? Or is the form of the contemporary hybrid artefact, multivalent? That is, where it can be found, who makes it and how it is experienced?

2. PRESENCE – some debates

Debates around presence over recent years have most often hinged around the notion of telepresence,

the use of remote control and the feedback of sensory information to produce the impression of being at another location; a sensation of being created in this way. (OED 2004)

The rapid deployment of global computer networks, in particular the World Wide Web for the general community, suddenly gave presence another meaning. Few of us will forget the first time we linked to a server on the other side of the world, receiving the image of a webpage a few seconds later – the finger tips tingled, the sensation was palpable.

Telepresence as a topic of scientific investigation is a recent area of specialization. The International Society of Presence Research in a lengthy explication statement describes telepresence as

a psychological state or subjective perception in which even though part or all of an individual's current experience is generated by and/or filtered through human-made technology, part or all of the individual's perception fails to accurately acknowledge the role of the technology in the experience. (ISPR 2004)

From computer games running across LANs and the internet, to websites designed to entice the visitor and have them part with money, the problem of maintaining a sense of self that re-assures and confirms our inclusion in its reality, has become of germane necessity in the fields of HCI, VE and AI. As Carrie Heeter, the Virtual Professor from Michigan has observed,

Presence research has emphasized engineering the senses more strongly that it has engineering the mind. (Heeter 2003)

Heeter's assertion that there is a distinction between a sense of presence "in mediated experiences" and "in unmediated life" has lead her to propose that presence researchers need to study the experience of presence in real life. (Heeter 2003) Heeter's Cartesian re-iteration flies in the face of arguments mounted earlier by Mantovani and Riva,

building on the work of Zahoric and Jenison (1998) through Heidegger and J. Gibson. It avoids such dualistic constructions to propose an 'ecological approach' and establish a relational presence based on resources not being the 'properties of either object or subject, but of their relation', (Mantovani & Riva 1999). Gibson's image of a tree in the middle of a field on a summer's day being only an 'affordance' to those who seek its cool shade being an illustration of 'resources, which are only revealed to those who seek them'. Mantovani & Riva go on to amplify this distinction with the argument that presence is a social construction "mediated by both physical and conceptual tools which belong to a given culture" in which there is "the emphasis of ecological approach on the primacy of action on mere perception" and that "action is not undertaken by isolated individuals but by members of a community. Ultimately, there are only two elements which guarantee presence: a cultural framework and the possibility of negotiation of both actions and their meaning". (Mantovani & Riva 1999)

This tends to support work developed a decade previously by R.S.Lazarus under the heading Cognitive-Relational Emotion Theory which set out to propose

..that emotions work through a set of interdependent systems including processes for cognitive appraisal, physical interaction between person and environment, coping, and emotional response itself. (Huang 1999).

A descriptive analysis of this kind enables empirical intervention and the measurement of response levels and thus the emotional component within presence perception, initiating projects across a diversity of disciplines from psychology and physiology to ethology and ethnology. Though much of the debate in associated research groups and an annual conference discusses the two quite distinct meanings, little reference is made 'across the fence' to parallel work that has been done in the humanities.

The notion of embodiment for instance, 'a body's vulnerability to being altered', (Vasseleu 1996) has been debated extensively in this respect as encompassing the whole aspect of the person. The materialization of the subject is constituted through the human presence aligned with artefact, an entity or combination of possibilities effected through the extension of the senses. The mission – to map the network of relations between the material and the social. (1.)

At the core of the present distinction between 'presence researchers' is:

- those who investigate 'presence (telepresence) and reality', something measurable in the terms described by Lazarus;
- those who reveal 'presence and consciousness', as something far harder to measure in the *noosphere* of data space amongst the 'interacting minds and memes on Earth' (2.)

The necessity is to create a context, an interface, for increasing the quotient of meaningful presence in each of the models we are constructing.

3. Models of Interaction

This section will outline the research implicit within manifestations of a highly experimental nature, the visual and media arts, where both methodology and evaluation are no less present or as vigorous as those undertaken but in a different way in the sciences. Earlier studies have begun the work of analysing interaction in art, its mechanisms and possible ramifications:

...several situations that characterise the relationship between the artwork, the artist, viewer and environment ... static, dynamic-passive, dynamic-interactive and dynamic-interactive (varying) (Candy & Edmonds 2002)

The term 'telepresence' is broadly understood amongst media theorists and arts practitioners as that sense of knowing or feeling another human presence across a physical distance ('afar') mediated by media (whether

telegraph, telephone, teleconference, etc) and interacting with the other presence; or

a compelling sense of closeness (Smalley 2004)

and

To be in the telepresence of another, of others who in turn feel your own telepresence close to themselves, is to define community in a quite radically different way (Ascott 2003, 265)

Practice-based research, in the form of physical installations made by designers and artists that either amplify the visitors sense of presence, or interact with the visitor's presence through the use of electronics technology, are the models that can provide a way of ventilating some of the ideas and concerns being raised by more formal research methods, into 3D HCI for instance.

These models, which range in scale from portable three-dimensional artefacts to room-sized installations, address the issue of presence from a variety of approaches. To begin this brief survey, the work of James Turrell – which happens not to be mediated by computer – can produce an awareness of the interactive situation by amplifying the agency of the subject in defining his or her sense of presence.

Upon entering the twin portal of James Turrell's *'Between That Seen'*, the visitor enters a dimly lit space 3 x 8 x 12 metres, at the far end of which, half way up the illuminated wall, is what appears to be a landscape proportioned screen. (3) "Benches at the rear of the space, facing the glowing screen, suggest that the movie is about to start and I sit to wait. After a minute or two nothing has happened. By now my eyes have grown accustomed to the low light level and I examine 'the screen' more closely. Maybe it isn't a screen. I rise and move towards it. 'The screen' has an edge to it. The edge marks the transition between the room in which I stand and 'another space' beyond. My eyes strain to

determine the depth of the space beyond the edge, but fail initially to determine how far back the second space goes, where the 'back wall' may be.... the light is so evenly distributed that it is like looking into a fog..... Returning to the bench in the body of the room I am now sitting in a room with a slot in one wall, the illusion of being in front of a projection screen being suggested by careful control of the light intensity and colour in and around the slot and the familiar experience of sharing the public screening space of the cinema." (4)

I learn later that Turrell has produced a body of 'aperture' works that explore a phenomenon known as Ganzfeld in perceptual psychology, a visually experienced space in which no surface or dimensions are detectable. He commented:

Light is a powerful substance.... But for something so powerful, situations for its felt presence are fragile.... I like to work with it so that you feel it physically, so you feel the presence of light inhabiting a space. (Brown 1985)

Thus the physical reality of this space, its construction with perfectly ordinary building materials, is activated by my presence. Arriving with my enculturated baggage of expectations to read the signs directing my behaviour, ('this trace relates no less to what is called the future than to what is called the past' - Derrida), eventually I resolve heuristically the set of relations actually in play within the space. Using the most pervasive technologies - electricity, gyprock and paint - "being there" is not a complex emotion to summon. The stages of cognitive information processing that establish a relationship between perception, attention and memory described by Barber (1988), helps explain how this occurs. Furthermore, with interventions into the space by the 'performing' presence of other visitors, fracturing, spoiling, 'showing the cracks' in the construction of the edifice, a system develops between the protagonists related to a state of distributed cognition (Hutchins and Klausen 1992).

Like the subtle gradations of light in the half-darkened space, I am conscious of emotional shifts as I respond to the artwork. Is it useful, is it possible to measure these responses?

Konrad Lorenz (1977) observed, we live inside our machine to know the world and as the EMMA project observed through Tart (1990), our reality is virtual, our perceptions are constructions, simulations of the world's processes. (Alcaniz et al 2003) The Virtual Environment which this European team of researchers proposed, "focused not only on generating and enhancing presence, but also measuring it." The series of experiments synthesis emotional states by means of 'mood devices', employing a range of approaches and technologies. Outcomes go beyond measurement of emotional states to be able to "reach a higher number of people suffering from psychological problems."

In the controlled environment of the laboratory, presence is acknowledged by the subject through changes to the virtual environment. Likewise, the physical environment in which the visitor/subject stands can be rendered subtly and almost intangibly.

In *Swarm* (Alex Davies 2003) the projection system unrolls across a wide screen format (6 : 1) a series of vertical frames that mix images of figures with images of space, a representation of the space in which you stand. They flicker as the vertical frames are replaced, as if from some scanning mechanism, replacing what was here with what is there, now – yourself, your companions, replaced again, in different frames, by strangers, whose images were probably captured and stored on some earlier visit. The visual rhythms are heard and change in pitch and volume as the greytone densities vary to the pulse of the picture as it sweeps across the wall from left to right. You, the visitor, move towards and away from the spectres on the wall, looking as you do, for the precise location of the tiny lens poking through the screen. This camera

can form images where light is scarce, such as in the darkened space of this provisional cinema. They trade your image for your inclusion in the mystic writing pad of the palimpsest into which you have entered. The data space is constantly provisional, always in flux, your presence now absent, a previous presence now present. The space becomes charged with time.

Does perception of the machine's response to the subject require a degree of amplification sufficient to register above the level of 'normality' in the environment?

This was an issue illustrated in an installation, '*Changing Light*' by Chris Welsby at Artspace, Sydney in April 2004, where a white screen 4 x 3 metres, horizontally mounted 40cm off the floor, reflected a moving image from an overhead projector connected to a DVD player and computer. The image was of the surface of water in a lake surrounded by a rocky landscape with trees and vegetation.

Welsby describes the installation:

As the viewer moves around the projected image however, the spatial coherence will be disrupted as the reflection will remain stationary - the water will reflect only the image of the trees and rocks which surround it and not the image of the gallery. The interactive presence of the visitor will cause the apparatus to sample different aspects of the original recording made at the lake. These will sample the complex variation in the water surface caused by a mixture of wind and human intervention. In some parts the surface will be still, reflecting a perfect mirror image of the sky and lakeshore. In others the surface will be more ruffled causing the reflection to be fragmented, rather like an impressionist painting. In the more choppy sequences the reflected image breaks up completely becoming a complex pattern of colour, light and shade. As the water surface becomes more agitated the illusion of pictorial space gives way to

a complex dance of enlarged pixels, foregrounding the technology and shifting attention to the here and now of the gallery space. (Welsby 2003)

He continues

The software for Changing Light has a threshold level that means the more people who come into the room, the less sensitive to change it is ... with a large crowd the changes to the image would actually slow down ... if just one person comes into the room the machine stays very sensitive to their motion ... the more contemplative the relationship, the more subtle the perceptual activity becomes - this piece favours small numbers of people moving quietly around and looking carefully...(Leggett 2004)

Welsby's extensive oeuvre, starting with film in the 1970s, more recently video and now digital technology, follows within a long tradition of artists who stand before the physical world of botany and topography. They present to us models which, like Turrell's work, negotiate a sequence comprising perception, action, cognition and effect that can be used to analyse the various stages of consciousness experienced whilst within the interface of the artwork - the processes, technology and materials describing the artefact's making, our reception of them, and the synthesis that helps us define for ourselves the significance of, in the case of *Changing Light*, where nature, culture and self are in confluence.

The technology inserted into the gallery installation was a camera and image analysis software monitoring the comings and goings of visitors and selecting tracks accordingly from the DVD of the lake recording. Thus in the dynamics of the installation, two cameras function - one camera has recorded the surface of the lake, the other responds to the presence of the visitor and makes the work, in the present, of the past.

4. CONCLUSION – Models of Presence

Encounters such as described in these three models are often similar to social spaces, as strangers and friends intermingle. They create a

hermeneutic space which through interactivity, between artist/designer, visitor(s) and machine, enable the system and its representational forms to be comprehended and negotiated, if not reassigned. In the EMMA project laboratory, the reassignment of representational forms to measure a subject's emotional state within a highly controlled virtual environment, redirects the notion of a 'multiplicity of interactions' into potentially hazardous areas.

Practice-based research and interactive models created by artist, designer, scientist and engineer must of necessity be regarded as relational to the presence, in physical and virtual space, of the interacting subject and the machine. Researchers, besides working in the domain of cyberspace, must continue working in public physical spaces, such as museums and galleries, stadiums and plazas. The machines and their uses are becoming well-suited to a multivalent experience that is at the same time, individual, collective and creative.

Notes

1. Sadie Plant has observed that tactility is very closely related to the word 'contact'. "The computer itself for example is in a sense a 'touching machine' in as much as it is simply composed of contacts or switches, continual contacts being made and broken. ... So the computer itself functions as a complex, tactile system." (Plant 1996)
2. 'Noosphere' as described by the appropriately shared multilingual community space of the Wikipedia:
[http:// en.wikipedia.org/wiki/Noosphere](http://en.wikipedia.org/wiki/Noosphere) (Accessed 10.7.04)
3. James Turrell (USA b.1943) work was seen in the exhibition "Space Odysseys – sensation and immersion", curator Victoria Lynn, Art Gallery of NSW 2001
4. From notes by the author about the exhibition.

References

Alcaniz, M. Banos, R. Botella, C. Rey, B. (2003) 'The EMMA Project: Emotions as a Determinant of Presence, PsychNology Journal V1 N2.

Ascott, Roy (2003) 'Telenoia' in Telematic Embrace, ed Edward Shaken, UC Berkeley.

Barber, P (1988) Applied Cognitive Psychology, Methuen, London.

Brown, Julia (1985) Interview with James Turrell, Los Angeles Museum of Contemporary Art.

Candy, L. & Edmonds, E.A. (2002) Interaction in Art and Technology, Crossings; Electronic Journal of Art and Technology <http://crossings.tcd.ie/> Volume 2 (1). Accessed 12.7.04.

Davies, Alex (2003) Swarm. <http://schizophrenia.com/frmindex.htm> Accessed 1.7.04

Derrida, Jacques (1973) 'Differance' in Speech and Phenomena, NW University Press.

Heeter, C. (2003) Reflections on Real Presence by a Virtual Person, Presence V12 N4, MIT Press

Huang, M (1999) Presence as an Emotional Experience, Medicine Meets Virtual Reality ed Westwood et al, IOS Press, Amsterdam.

Hutchins E. Klausen, T (1992) 'Distributed cognition in an airline cockpit', in Communication and Cognition at Work (Middleton D, Engestrom Y, eds) CUP.

International Society for Presence Research (www.ispr.org) Accessed 12.7.04

de Kerckhove, Derrick (1995) 'The Skin of Culture' Somerville, Toronto.

Leggett. Mike (2004) Changing Light – new work from Chris Welsby, SCAN online journal, Macquarie University, Sydney 2004.

http://scan.net.au/scan/magazine/magazine_about.php Accessed April 2004.

Mantovani, G Riva, G (1999) "Real" presence: how different ontologies generate different criteria for presence, telepresence and virtual presence', Presence: Journal Teleoperators and Virtual Environments, 8 (5) 538-548.

Plant, Sadie (1996) Coming into Contact, in Touch forum proceedings, Artspace Sydney.

Plato, 'Phaedras' (1956) Trans W.C.Hembolt and W.G. Rabinowitz, Indianapolis, Bobbs-Merril.

Prothero, J Parker, D Furness, T Wells, M (1995) 'Towards a robust, quantitative measure for presence'. In Proceedings of the Conference on Experimental Analysis and Measurement of Situation Awareness.

<http://www.hitl.washington.edu/publications/p-95-8> Accessed 1.7.04

Read, Herbert (1964) 'The Philosophy of Modern Art' Faber London.

Riley, Bridget (1965) www.jameshymanfineart.com/pages/modbrit/thumbnails/1
Accessed 12.7.04

Smalley, Mark (2004) Telepresence and the Extension of Embodied Consciousness, Proceedings of Pixel Raiders 2, 6-8th April 2004, CD-ROM ISBN 1844370606, Sheffield Hallam University.

Ulmer Gregory L. (2002) Reality Tables: Virtual Furniture, Pre-figuring Cyberculture, ed Darren Tofts, Power Pubs / MIT Press.

Vasseleu, Cathryn (1996) Touch, Digital Technology and the Ticklish, in Touch forum proceedings, Artspace Sydney.

Waterworth, J A and Waterworth, E L (2003). The Meaning of Presence, Presence-Connect, 3 (3),

<http://presence.cs.ucl.ac.uk/presenceconnect/articles/Feb2003/jwworthFeb1020031217/jwworthFeb1020031217.html> (Accessed 1.6.04)

Welsby, Chris (2004) Changing Light catalogue notes, Artspace, Sydney. Also <http://www.sfu.ca/~welsby/> (Accessed 1.6.04)