Performing space

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This article discusses how the notion of performance provides impetus for the design of interactive digital environments. These environments can ultimately be regarded as user-spaces; a condition which replaces the 'fixed' art-object with a configuration of interactions. Our understanding of space, as suggested by Lefevbre (2001), defines the 'inhabitant' as a full participant, a user, a performer of space. What is at play when the installation artist designs environments that invite performative exploration? The issue of improvised performance in the inhabiting of installation spaces is exposed. Two interactive installations by the author and works by others in the field provide a context for discussion and analysis.

1. STORAGE SPACE: RE-INVENTING ACCESS

The digital computer has penetrated different strands of creativity to the extent that it has fundamentally changed the way we are exposed to media objects such as music, film, and visual art. The digital interface introduces a re-fragmentation of audio-visual media in which segmented information structures are recombined as interfacial objects. The difference between the analogue tape recorder and the hard-disk recording/playback application represents not only a shift in storage media but, more significantly, a cultural re-invention of practice. This praxis of access permeates the use of digital media, from the 'author' to the 'end user'. It articulates the action of accessing a previously stored item, making selections, marking items, encoding media for remote access (i.e. playback in conditions beyond the control of the producer). Technological developments in storage media are implicated in numerous revolutions related to the way an artist approaches the creation and distribution of her work. Sound-based work, for example, typically falls into the generalised format of CD playback, multi-track tape, or audio-file exchange. The format that wraps the dissemination of a media work is likely to impact heavily on the way that the work itself is produced. Electronic-based media formats and, before those, standardised modes for distribution (framed canvas, published scores) effectively shape a discourse that is centred around the art object, an 'Object Oriented Art' (Norvell 2001).

A characteristic of new media that makes it distinct from other formats relates to the storage process that is intrinsic to the digital computer. The linear storage modes of film and magnetic tape are replaced by random-accessed hard disk segments. This shift in storage media introduces a level of familiarity with media control that is perhaps unprecedented. The end user (audience) of an interactive CD-ROM is aware of different file types, data formats, screen resolution, sampling rates, in a context of constant re-configuration and control, i.e as computer files are displayed on our screen, we expect the possibility of changing parameters such as scaling or zooming. This user-empowerment, led by modes of distribution, is fundamentally distinct to the viewer of a painted canvas, who might be aware of different types of brush strokes and pigments but has no influence on the display mode of the painted object. The digital computer is, by definition, an interactive environment which, in line with user-empowerment, proposes re-configuration. The operations of Play, Stop, Rewind and Forward are extended to search, select, copy, paste, scaling and sorting, amongst others. This added refinement puts the user – the inhabitant of digital space – in a position of augmented control. This position expects an equally sophisticated level of response from the digital environment. Alert messages, operational predictions, error codes or loading bars are modes employed by the computer programmer in order to provide feedback to the user. It is in the space between control and feedback that the inhabitant of digital space operates in what can be called a performative improvisation; it is in this interstitial space that identity is outlined. A generalised and somewhat superficial comparison between performing action in the realms of conventional artistic practice and computer interface navigation reveals certain common principles. The amateur piano player might struggle to follow a pre-determined action (score) in an effort to display to her audience the content of a particular (musical) object. Inevitable inaccuracies and technical shortcomings that might arise during such an event induce the performer to access improvisatory tools which ultimately allow for the preservation of the initial action. Our performer will stop and start with an apologetic discourse while addressing the

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urge for carrying out the proposed action. She might, on the other hand, address inaccuracies by devising strategies for surfacing materials and content, and produce an interpolated continuum. In a social context, the role of the digital interface user, while performing a task as simple as displaying a series of images on the screen, bears remarkable resemblance to our performer. As the digital interface user accesses a media object for displaying in front of an audience, she performs a series of operations not unlike those that occur when following a musical score. As obstacles and unexpected re-configurations infiltrate this series of operations, the user is urged to improvise and create alternative routes and processes for achieving an equivalent result. One could consider a comparative study on body language, gesture, decision-making processes and timing, relating to these two situations. No doubt certain parallels would emerge and perhaps disclose some of the intuitive processes that might be at play in the action of performance, both at an interpretative and prosaic level. The notion that one defines an identity through performative action is the main focus of this article. As the user/performer is exposed in the execution of a task, she radiates identity traces that become readable by others and outline specific contextual behaviours.

2. PERFORMED SPACE

Our notions of performance are intrinsically connected to inhabited space as our daily performative actions are greatly modulated by the spaces we inhabit. Lefebvre describes his notion of representational space as 'space as directly lived through its associated images and symbols, and hence the space of "inhabitants" and "users"' (Lefebvre 2001). The 'users' or 'inhabitants' act as agents that facilitate the articulation of space. This suggests that, at some level, the inhabitant carries a performative role. A performing space implies a sophisticated interaction of communicative modalities, multiple channels which allow for communication between humans, or humans and computer systems (Bongers 2002). A performance space, in the context of nonlinear digital media structures, implies sophisticated analysis in the areas of gesture, one-to-many communication schemes, individual presence, idiosyncratic action, and instrumentality. The performing body operates in a space of expectation, in a space that tends 'towards more or less coherent systems of non-verbal symbols and signs' (Lefebvre 2001).

The notion of performance itself implies a somewhat nonlinear environment. While the performer has some level of control over the environment and potentially over a performative instrument, it is the uncontrolled, the chance events, the risk, that defines the performance environment. It is the 'nonlinear' that is responsible for the chemical reaction between a performer and her audience.

Our perception of sound is related to the notion of performance, in particular, improvisation. In our everyday listening process, we derive enormous information from sound alone; a lot of this information is related to how a particular sound is produced. We 'detect' materials, intention, weight, density, we perceive assertion, fragility, uncertainty and control. Our everyday experience is articulated as improvised action that is dependent on a series of (aural) cues. The notion of sonic profile suggests a mode for perceiving cues in a complex layered soundscape. If we understand the term soundscape as a definition of an arbitrary aural environment (Schafer 1994), then the sonic profile can be defined as an internalised mapping of a soundscape – an outline describing the superimposition of various sources, events and their sounding in a space, as perceived by the listener. As a multiplicity of sonic profiles reaches us, we perceive aural space as multi-dimensional. Sonic profiles are formed as sound sources reach our ears; a superimposition of profiles allows us to read the soundscape in terms of the interaction between sources, their prominence, their potential for occlusion, masking or differentiation. This multiplicity of profiles invites us to perform listening paths through a complex soundscape environment (Rebelo 2001). As the body performs in listening space, it becomes aware of other bodies and sets in motion a series of behaviours which outline our reactions and expectations in a group context. Is the group of bodies, however, enough for the emergence of a community operating in an interactive environment? A group of inhabitants over time inevitably develops communication strategies, behavioural possibilities and common understandings; as these interactions get inscribed in the performance of the group, the potential for community arises. The outline of the improvisatory environment suggests that interaction between roles and attitudes occurs at a level that overpowers the exchange of content itself. George Lewis refers to a shift in emphasis from form and structure to cultural and social narratives in the case of improvised music. 'Improvised music de-emphasises Western "classical" notions of form and structure in favour of the exchange of cultural and social narratives' (Lewis 1999).

In a constructed performance space, the notion of community in an improvisation context implies the pre-definition of behavioural strategies. These strategies are commonly structured through fixed, 'anchor' nodes that permit change at various levels (including changes that affect the anchor nodes themselves). Theatre director and theoretician Augusto Boal attempts an emancipation of the theatre audience to a

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state of 'spect-actor'; the viewer becomes an active part of theatre (Boal 1988). By setting up a series of theatrical situations (interactive behaviours), often socially charged environments, the audience member (inhabitant of theatre space) is drawn to intervene. Boal carefully composes theatrical situations which depend on this intervention. With his 'Theatre of the Oppressed', Boal defines a space in which performative action becomes the uniting factor between the actor and the audience in the traditional sense. The process of combining pre-determined content with space for 'user-intervention' has perhaps not yet fully matured in the context of digital environments as much as it has in Boal's theatre.

3. INSTALLATION SPACE

In his discussion of the role of the image in a digital world, Levy states that '[the image] abandons the exteriority of spectacle to open itself to immersion' (Levy 1997).

Environmental, spatial and social constructs are at the centre of art-making. The social milieu in which artistic activity takes place is often as important as the art-work itself (Dada, Fluxus, Actionists . . .). By virtue of global distribution and format standardisation, this layer of influence has been dispersed away from an artist-centred perspective. It is not until the nineteenth century with the emergence of 'independent' artists, that the art object is emancipated and pursues a life that is independent of its creator – 'an exteriority of spectacle' (Levy 1997). This represents a modernisation of artistic practice that relies on some standardisation in delivery methods (the museum, the orchestra, the opera house . . .). In contrast, the pre-nineteenth-century composer wrote music for a specific condition that might have involved a particular performance space, a particular audience, certainly particular instrumentalists and instruments. The Renaissance painter created work for particular environments, known light conditions and specific viewers. The pre-modern artist's area of influence is far greater than the object-centred practice that emerges in the nineteenth century. The context in which an art-work is created supplies the artist with a multi-layered entity, prone to transformation, critique and play. The community at the centre of artistic activity (artists, public, patrons, critics . . .) suggests its own modalities and communication strategies.

As the contemporary artist 'installs' space, the action of establishing permeability between the context and the work is developed to the point at which the perception of the art-work as an object is dispersed. This dispersion is carried through as a process which eventually inverts the relationship between the object (abstract, concrete or conceptual) and the context. The context might provide the articulation of the art action itself. Site-specific practice often treats the site as a way of delineating context for an artistic intervention; the site suggests parameters, materials and conditions which become the impetus for action. It is no longer the object that visits the site while maintaining its identity but the site that invites coalescing. The dispersion of the art-object, enacted by the contemporary artist through the act of 'installing', can be read as a romantic endeavour with a view to regaining the contextual control of pre-modern practice. It exposes a romance with courtly artistic life, an idolised environment in which the artist operates, their desires and fantasies carefully woven into the fabric of social space.

An installation environment can be read as a semi-configurable space which might react to a user's presence or action. The 'expert group' behaviour that is commonly present in performance is here replaced by a generalised 'visitor' behaviour, i.e. a 'non-informed' anonymous participant. This shift in the identity of the inhabitant exposes certain design issues in the context of interactive behaviours. The performed installation introduces a level of articulation of space which induces exploration by the 'non-informed' user. By inhabiting the installation environment, the user is induced to relate to a level of competence or involvement that can only come from the 'informed participant'. The familiarity that is assumed in the design of an 'expert-user' interface (e.g. a musical instrument) needs to be accommodated into interactive behaviours which transmit the potential for performative control. This level of interpretation needs to be re-mapped so as to provide the 'non-expert-user' with a relatively immediate and perceivable feedback system. The construction of interfaces that suggest a complexity of engagement that is rewarded through familiarity, and simultaneously provide an expected level of immediacy, is a challenging design task. It is the rendering of the dynamic relationships between the work, the site and the user that creates a potential space for performative interaction.

The complex relationships between an expert-user and the interface (e.g. performing with a musical instrument) need to be redefined for the non-expert user. This redefinition might relate to strategies of inference; a simple action acting as the trigger for a complex process. Input data coming from devices such as video cameras and other sensors require considerable treatment in order to convey an alliance between the user's actions and the interactive behaviour of the installation. This alliance is not necessarily one in which one part (the user) controls the other (the environment). Abstractions of complex interactions that occur incessantly in situations such as free improvised music or, for that matter, everyday social interaction,

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can be useful models in the context of input data analysis and mapping strategies. There is an opening between the controller and the controlled in which the process of mapping takes place. Rather than an inherent coupling between input and output, the mapping process suggests a matrix of possibilities which has the function of engaging the user.

4. PLAYING SOCIAL SPACE

Partial Space (1998)

Partial Space is an interactive sound installation, presented and in ongoing development by the author since 1998.[1] It consists of an environment in which inhabitants perform a resonant space. By moving in the installation space, the audience triggers sine tones of frequencies that correspond to the natural resonant modes of that architectural, physical space. Sound becomes the medium for experiencing architecture. The room is partitioned acoustically rather than rendered architecturally. There is a suggestion that the linear continuity of Cartesian space is here disrupted through sound. Our everyday experience of space is a product of our own bodily presence and behaviour. The body as an interface for space implies constraints in the way we stand and move. Resonance, which is notionally perceived as a simultaneity of partials and overtones, is conditioned by our listening modes. The resonant content of a physical space or instrument becomes restrained by our own listening intentions. Our ability to focus on particular partials when we hear complex spectra such as gongs, suggests a process of spectral deconstruction which arguably could be the very nature of our 'creative listening'. In *Partial Space*, resonance is broken up, not unlike the way architecture breaks up Cartesian space.

A process initiated by Alvin Lucier's *I am Sitting in a Room* (Lucier 1995) exposes a room as a potential musical instrument. The system at play in *Partial Space* can be seen as an inversion of the room as sound modulator. The externally produced sound does not emphasise the room as a filter and modulator of an arbitrary sound source (speech, in the case of Lucier's *I am Sitting in a Room*), but rather, the notion of acoustic energy (in this case a translation of the inhabitant's movement) triggers the resonant space to enact its presence at an audible range. By synthesising spectra that are directly derived from the site's resonance response, the produced sound acts effectively as energy input and the perceived sound is the amplification of that input by the site. In other words, the site vibrates sympathetically with the source.

A recording of a noise-based impulse played into the space is used for spectral analysis. The resulting time-varying spectrum constitutes the basis for the creation of the interactive sound environment. The strongest partials provide the frequency content for a dynamic additive-synthesis environment. The spectral content of the reverberation time is elongated, allowing the perception of otherwise microscopic sonic events; the impulse decay event that lasts only a few seconds is extended to a twenty minute cycle. While presence in a particular area triggers the introduction of one partial, the inhabitation of that area disturbs the room's spectrum, activating modulated spectra and 'beating' frequencies. The spectral simplicity of the generated sounds enables the perception of both individual partials and synthesis/harmonies achieved by the multiple inhabitants in the same space. The way in which *Partial Space* defines a somewhat ambiguous but immediate interaction mode opens up the possibility for behavioural traces to emerge. A sonic simultaneity is rendered by the presence of multiple users, establishing a sense of play and interaction between the inhabitants themselves. After exploring the installation for some time, each of the arbitrarily defined areas (eight in total) becomes identifiable with a particular frequency range – the fluctuating trajectory of a particular partial through time. This identification process can be read as the expectant result that allows some instrumental control by the inhabitant, and therefore interaction with the environment and other inhabitants. An extrapolation of this process into a more refined system proposes that our 'creative listening' modes are externalised and reconfigure themselves as social behaviours.

Works such as *Partial Space* attempt a transition from the notion of the art-object to process, distributing a finite condition to a set of possibilities. Ed Osborn's *Last Call* (1995) translates the visitor's movements into oscillations that are in turn transmitted to metal wires stretched across the installation space (Osborn 2001). These resonances are then amplified and heard from a loudspeaker placed at the opposite wall of the space. Osborn's work is inactive when there is no human presence, but as the inhabitant's curiosity draws them towards the source of sound (the loudspeaker), the oscillation they activated fades away and the sound vanishes. Osborn sets up a condition for interaction which exposes the ephemeral nature of sonic phenomena. The physicality of the set of stretched wires turns presence and motion into a clear, identifiable instrumental action (i.e. movement causes oscillation). It is the play with the expectant result (as in traditional compositional structures) that turns *Last Call* into a performative space in which the manipulation of the instrument is clear though the sonic result is ephemeral.

The significance of physical entities in a space which interfaces the inhabitant's behaviour with a digital

[1] *Partial Space* is implemented using video tracking software (BigEye) and real-time audio (MAX/MSP).

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environment is discussed by Todd Winkler in his account of movement-sensing installations (Winkler 2000). Winkler points out how physical interfaces give rise to the notion of play, in the sense that a visitor to an interactive installation is analogous to a player in a game. The use of familiar physical objects is common in new media works because they liberate the artist from engaging in an instructional process with the user. The familiar object carries a set of expectations and cultural signification which the artist often capitalises on, whereas a novel interfacial object requires explanation. Jeffrey Shaw's *The Legible City* (1988–1991) relies on such a familiar navigation interface – the bicycle. By manipulating a stationary bicycle, the user navigates the projection of a cityscape. Further familiarity is introduced in the configuration of these virtual cities, based on actual ground plans of Manhattan, Amsterdam and Karlsruhe, but composed solely of three-dimensional text, in place of architectural form. The plan of a city, known or unknown, provides a series of identifiable expectations in terms of layout, proportions and scale. While assuming a level of competence in performing functions such as speed control and handlebar turning in a bicycle, Shaw designs a space in which the participant is performing an instrument with which they are already familiar, allowing a level of immediate virtuosity.

Shaw's *Configuring the Cave* (1996) re-accesses the interface for navigable space, in this case as rendered in the Cave 3D visualisation environment. By making use of yet another familiar object – a near life-size wooden puppet formed like the prosaic artists' mannequin, Shaw establishes two parallel modes of interaction. The puppet acts as an input device for the digital environment but also suggests some physical interaction amongst the users who are invited to collaborate on the manipulation of the puppet's limbs, hence constructing collective postures. The puppet in *Configuring the Cave* creates a field of possibilities for improvisation which from the outset carry a series of culturally established meanings; some configurations of the limbs will be perceived as ridiculous, humorous, perverse or sensuous. The interfacial reference to the body grounds a performative space by calling on behaviours and meanings that have significance beyond the art-work. In defining what he calls a new aesthetic, Shaw redefines the art-work as 'more and more embodied in the interface, in the articulation of a space of meeting between the art-work and the viewer, and even in the articulation of a space where the art-work as an artifact seems to disappear altogether and only communication between the viewers remains' (Shaw 1996). The notion of communicative action as the core of artistic activity implies experiential modalities which transgress the object fetish, its appearance and definition. In *Partial Space* the emptiness of the gallery creates a void (notably the absence of a 'physical' art-work) which is articulated by a sonic interface that renders resonance and leaves the user with the possibility for interaction with other users, hence creating habitable space.

SlIce (2002)[2]

SlIce is an interactive multi-user installation that explores the notion of a coherent media surface (a set of context-specific audio and visual materials) which is activated by user-interference. An interactive media environment is created which allows for negotiation between audio-visual material and user-based interactive behaviour. The users' presence is detected by means of pressure sensors on the floor. In *SlIce*, the temporal/narrative dimension is left open while the media context and interaction modes are fixed. Although users have some control over the triggering of media events (without user input the environment is left in stasis), they are not 'in control'. At an experiential level users 'play' in the environment as they are invited to explore certain combinations and actions. As users become aware of the sensing devices (pressure pads on the floor), they become an active participant in a transient game. The multi-user aspect of the environment suggests that a sense of community is created as a group of individuals share a common media space.

SlIce consists of a circle of six networked Macintosh computers which receive instructions from one 'master' computer that runs audio processing and interpretation/analysis of floor sensor pad input.[3] The basic functioning of the installation comprises a circle of computer monitors that display video segments of ice skaters. This circle is punctuated by six floor pressure pads that 'detect' users' presence. By stepping on a pressure pad each user creates a disruption to a loop, triggering audio samples (vinyl and digital distortions of a track by Quincy Jones) and 'attracting' video segments (i.e. ice skaters) towards her location within the circle. The relatively simple trigger mechanism provides instant feedback to the user. The level of immediacy suggested by the system opens up the possibility for performative action as the work is quick in exposing its instrumental framework (sensor pads, cabling and hardware are not concealed), hence making the user familiar with the interface. The notion of surface and disruption links the sound materials to the video content (ice-skating). Although familiarity with the context of the work is an element that requires

[2]Designed by l a u t (Pedro Rebelo and Franziska Schroeder); Stills Gallery, dialogues festival 2002 –Edinburgh; with support from the Calouste Gulbenkian Foundation. More details on *SlIce* at www.lautnet.net

[3]*SlIce* is implemented using MAX/MSP with the Open Sound Control network protocol. The sensor input is received by the I-Cube analogue to MIDI interface.

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some user exploration, the configuration of the physical elements of the installation (monitors, sensor pads, cables) suggests their own articulation. The user is confronted by a circle which offers six entrance points, perhaps an invitation to Bentham's Panopticom (Bentham 1995) and the promise of 360º surveillance. The entrance to this space of control is, however, the same action that causes a reconfiguration of what is being viewed and heard.

5. CONCLUSION

The interactive installation environment poses provocative questions that relate to the nature of our engagement with an art-work. Our cognitive process becomes exposed to some extent, as connections, patterns and structures become embodied in an environment. In some cases (e.g. *SlIce*) the user's investigation of an unknown environment is rendered in physical movement, which in turn represents decision-making processes. The exposure of the user's thought processes raises the issue of control in artistic/design. The augmented control provided by the designer of interfacial objects anticipates the moment in which the user enters the creative process; the artist/designer sees the user's behavioural identity as an integral part of the work itself. As with the pre-nineteenth-century court composer, the audience, situation and occasion condition the processes with which the artist engages. The construction of an environment which induces behaviours that are known to us, such as play or group interactions, positions the artwork in a condition that is ultimately event based. The experience of 'playing' an interacting environment is significantly different from that of the viewer of 'static' works. The notion of improvisation, in the context of interactive environments, establishes an experimental role in the user. As the inhabitant is confronted with a performative condition, she enters a process that modulates and exposes identity. It is this call for identification that suggests a fresh approach to the interfacial condition that encompasses the 'artist' and the 'public'. The emergence of behavioural traces in the experience of an art-work urges the artist/designer to engage in a reconfiguration that transforms an object-oriented-art into a performative environment. As time and 'occasion' are celebrated, the artist calls for an audience that is implicated in the design process. The processes of improvisation at the core of theatre, dance or music convey a rich resource from which we can derive notions of interfacial behaviour that are essential for the development of spaces that accommodate the active inhabitant. However, it is not the Wagnerian dream for the integrated, universal work that carries the potential for performance spaces. If performance is ultimately connected with identity, with its attributes, traits, breakdowns and idiosyncrasies, it is the particular, the specific and the local that invite intervention in a cultural surface that predominantly tends towards the smooth, the general and the universal. As the notion of locality is liberated from the confines of physical geography, it becomes a crucial force in redefining the artwork and its cultural implications, a condition that leaves the installation artist engaged with multiplicities of localities, communities and technologies.

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