Interactive Painting: An Investigation of Interactive Art and its Introduction into a Traditional Art Practice

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Abstract

This practice-based study investigates the application of an individual studio practice, grounded in Painting, to notions of interactive art, and seeks to establish how the interactivity might impact upon the meaning and the affective power of the work. It investigates the current state of interactive art, its ancestry, development and contextualisation, leading up to its presumed current location within New Media. The thesis examines a range of both theoretical and practical artistic research outputs. It investigates interaction models and taxonomies from New Media, and a range of other interactive disciplines, in order to inform the development of successful paradigms for interactivity as a parameter of an emotionally engaging and communicative art.

A number of problems are identified in conflicting conceptual models; an emphasis on the technical and behavioural over the visual, and on human-human over viewer-work interaction; an emphasis on the open meaning and the dispersed author undermining notions of intrinsic meaning; and a foregrounding of play, of pleasure, rather than a deep emotional engagement.

The practice, supported by comparisons with related practices, peer discussion and viewer feedback, develops a language of small gestures, textures, layers, sounds and behaviours. It develops away from New Media towards an exploration of the specific nature of the computer as painting medium, and identifies specific models which are useful in informing the development of screen-based painting as interactive. It identifies the model of Interactive Painting as a way of conceptualising the work, which is informed by several key models. Firstly, it identifies Elemental Interactivity; intrinsic, related to both the form and the content, an integrated element, in which the work and its behaviour are one. This is supported by models of Intuitive Interaction and Real-World Models, supporting viewer perception of real-world activities, and informed by characteristics of Simplicity (of interaction and process), and by a small scale and intimate kinaesthetic or Gestural Interactivity. The study identifies a successful model in Open-Ended Exploratory Interaction within a Navigable Space, which is informed by the concept of Wholeness, of the interactive artwork as a holistic or integrated object, which behaves. It identifies

Interpretive Interaction as a means of building layers into the work and including a model of Making Cognitive Interaction Concrete. This Interpretive Interaction is contrasted by elements of goal-driven or creative interactivity, providing a shifting dynamic and dramaturgy. It identifies this dramaturgy, the use of humour, pace, mood and elements of and surprise as means of producing the important shift between Immersion and Reflection.

Finally, the study examines the visual qualities of the medium. Through comparisons between this medium and Painting, it identifies a specificity for a genre of Interactive Painting, as expressive, immersive, rich, imaginative - a dynamic, controllable and Human re-interpretation of old and new media.

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Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work.

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Signature:

Date: 11 February 2008.

1. Questions and Methodology

This study seeks to explore how an interactive artwork can function as a communicative object with some intrinsic meaning or content, and what role different types of physical interactivity play in this process. It asks how rich an interactivity can result from a studio-based practice - non-networked and on a desktop scale- and how rich, how interactive it needs to be to communicate meaning and help the viewer[1] understand and engage. It explores the extent to which this limited interactivity may be interesting, intuitive, and suggestive and examines models which will inform this. It explores also the affective dimension, and the ability of the clean and controlled machine interaction to reflect, contain and engender emotion. Part of this is an exploration of the role and identity of the artist, (designer, facilitator, programmer) and how changing roles, media and processes affect her enthusiasm for and engagement with the art practice and the ideas that underpin it. This enthusiasm and level of engagement necessarily contributes to that of the viewer.

This study explores the balances between immersivity and distance, intellectual and emotional, time and space, and seeks to establish recommendations for both behavioural and visual aspects of an interactive art practice within a specific context. Contrary to the collaborative zeitgeist, it centres on and seeks to contextualise interactive artwork within an individual studio practice model. It concentrates on notions of interacting with the work, rather than exclusively with other viewers - either in situ or networked. Rather than exploring the social interaction and connectivity of the internet, where the immediate context is uncertain and noisy, this study looks at ways in which stand-alone interactive artworks might be distributed and framed. The majority are intended for exhibition (in a gallery, or other dedicated space). Whilst the early works are intended to be viewed on a standard desktop monitor, later works explore the possibilities of gallery framing, projection and scale. Ultimately, the study asks whether Interactive Art exists as a genre; whether it is necessarily located within New Media, or could be regarded as a reinterpretation of Painting; and of what that 'Interactive Painting' would then be.

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[1] throughout this report, for simplicity the term viewer is used and should be assumed to include the notion of listener, participant, interactor where relevant; the pronoun she/ her is used and should be assumed to include both male and female viewers.

Inevitably, the study was informed by my identity as both artist and lecturer in a Computing department, and an interest in Interactive Multimedia that started with an MSc undertaken at Huddersfield University. My approach to the computer as medium, as object, process and conceptual framework is informed by personal tendencies towards the 'lo-tech', the mixed- (traditional) media; and by a commitment to art as

> "experimentation, development and vitality...the need to challenge accepted norms and expose passive acceptances...a vital function - not a commodity or a business but a communication, a space in which experience happens"[2]

Morse describes a women's perspective, specifically that of women moving into technology from other areas of art practice, which seems to fit. It is a relationship with technology characterised by an internalised resistance and psychic distancing, which in turn leads to a transgressive approach to computer-based work that explores interactivity for its contradictions and mystifications. (Morse, 2003).

My fine art practice at the beginning of the study centred on painting and the construction of wooden relief supports.

Figure 1: What? Oil Painting 1997-8

Two notions of narrative underpinned this practice. Firstly, the painting offers a snapshot or iconic representation of a whole idea, relationship or story. Secondly, the works were intended to function as durational objects, having a

[2] from a "Demonstropist Manifesto", McMorran, F and Elsom-Cook, M 1999 - unpublished

time-based dimension; large-scale works in which the track of the viewer's gaze around the work over time unfolded or constructed a narrative. Thus they explored both the immersive, through the whole work, and the intimate, through the tracing of individual aspects or elements. My own practice has always been rooted in the broadly figurative, and the expressive - exploring themes, issues centred on love, its varying nature and complications, the different kinds of love and increasingly, of friendship, sexuality and human relationships[3]. What? (figure 1 overleaf) represents a relationship troubled by miscommunication and emotional 'baggage'. It offers both a 'snapshot' of the relationship, and the possibility of exploring detailed elements and linking these to produce a more complex narrative of that relationship.

My work has also explored Myth, from an early, Feminist interest in the appropriation of myths and folk beliefs by subsequent religions to a more Humanist examination of the emergence of some 20th Century faiths such as football, television and technology. These faiths become ritualised and endowed with power and the ability to hypnotise their congregation, to inspire devotion, zeal and sectarian fighting.

This practice extended into painted 3D objects, including both constructed and painted texture, and works constructed out of old images like a patchwork quilt.

Figure 2: Flag: TV 'Patchwork' Painting 2000-1

These offered a more oblique 'snapshot', which was more a statement or question than a story, but retained the essential idea of the artwork as a

[3] For example, see Cherry Smyth, *Damn Fine Art*, Cassell 1996 pp124-6

communicative object with an intended meaning. The re-use of old images added further layers of ideas and possible narratives - 'back-stories', reflecting an expansion from the purely personal to the wider 'human'. Formally, I felt this bricolage-and-painting combination would translate well into the computer medium.

Besides the notion of an intrinsic meaning, the notion of passion was a key underpinning to the practice. This refers to my own intense emotional connection with the content, subject or narrative, but also an intensity of emotional engagement with the creative process itself, its materials and objects. This implies also an attempt to establish an emotional response, understanding and empathy from the viewer. It suggests the notion of 'passionate objects' - charged with life and the power to evoke strong emotions. This combination - of the emotive and a notion of communication of meaning - has often suggested a confrontation with existing beliefs or world models. The viewer's response might be slow, simmering and reaching full force some time after the viewer has had time to assimilate the work, rather than necessarily a rapid, explosive one. This confrontation has produced works which were challenging and hard to look at – even with the inclusion of a dark humour which characterised many of the works. Therefore I wanted to balance that confrontation with some kind of free beauty, with a rich, visual complexity and layering.

The work had been moving away from the physicality of large gestures, of crawling over the surface of large drawings, towards a more painstaking construction of drilling and stitching wood.

Figure 3: TV Fetishes 2002

At the same time these works moved further from the idea of a 'story', from the constraints of figuration towards an iconic statement, and a further layer of meaning inferred from the disjoint between the form and the content. The works seemed to be moving further away from Painting, becoming less personal, less emotionally invested. This movement coincided with my own movement into Computing as a parallel career. A move into computer-based images was in many ways a logical development, although I hoped to bring back some of the sense of movement and emotional involvement, some of the complexity of meaning, through interactivity.

I wanted to bring together the different strands of my experience and interests in Multimedia Computing and in Painting and create something that existed in the space between them. Parallel to this, I wanted to create something calm and contemplative, even beautiful, which also has some reason to be - a purpose, message, challenge, or meaning - and contains within itself a space for reflection upon that meaning. The challenge, and the focus of the research question had, by the end of the study, become threefold:

- Firstly, to make interactive pieces which are intuitive and which stand up formally and visually, as artworks and as paintings.
- Secondly, to make pieces which are comprehensible and tell their stories or ask their questions through the interactivity.
- Finally, to make computer-based pieces which match the emotional, sensual, affective potential of the earlier object-based practice, through both their visual and their behavioural qualities.

The intention and direction of the work developed over the course of this study. What began as a rather dry academic study of the many faces of interactivity, including data collection from audiences and scientific comparison studies, became instead a challenge and an adventure in exploring the potential of the computer screen as a site for visual artworks. The early works explored a more complex and cumulative programmed interaction, which gradually developed into technologically simpler works as they sought to become experientially richer. Thus, a concentration on interactivity as a concept and a discipline gradually became a realisation that, whilst the interactivity was the key uniting factor in the works, and as such needed to have its own aesthetics and

language explored, it was necessary to regard the works firstly as art, or as painting; and only secondly as interactive objects. Out of this realisation came the final, and overarching research question:

- Is Interactive Art necessarily located within New Media, or could it be regarded as a reinterpretation of Painting; and what would that 'Interactive Painting' be?

An extensive investigation of key texts, artists' fora, and recent and current practical and written research was undertaken online, through conferences and galleries as well as paper-based published materials. This followed a route from the genres of Computer Art to New Media looking for models and recommendations. These suggested possible models and avenues of exploration in moving my practice on from an object-based, constructed and painted practice to one wholly centred on computer-based interactive work. Initially, works were constructed attempting to embody some of these models, but as the practice continued, a realisation of an imbalance between the intellectual and the emotive in the work - both process and product - refocused the investigation onto the medium itself and its potentials. Works constructed in the earlier part of the study were revisited in the light of new understandings and the ideas reworked partially or completely. This established a new working method to suit the emergent medium. Thus practice became firmly established as the principle tool for research, supported by informal interviews with practitioners and feedback from viewers. An early investigation of the theoretical and philosophical became centred on the personal, the pragmatic; the academic became the affective and instinctive.

Artists - online or actual contacts from earlier exhibitions and networks - were approached personally, and via the internet. Online exchanges were informal and conversational. Interviews were pre-arranged and conducted in private spaces, but informal and semi-structured, using prompts and directions rather than scripted questions. Both sought the artist's genuine and personal response concerning her practice, methods, and emotional relationship with them rather than any set of empirical data. Early feedback was elicited from a network of personal contacts, from outside the art (or computing) world. The works were subsequently exhibited at the University postgraduate degree shows, and in

specific feedback-gathering sessions. Visitors to the former were invited through the University and individual students' contact lists - including their personal friends and family, and people with an identified interest in art. Viewers also included casual visitors to the department and existing Art and Design students. Feedback was provided by self-selected viewers through comments books and the completion of a short questionnaire. A comments book was provided for each work, with three simple, general questions[4] on the inside cover, which also functioned as a key to the controls for the interaction. Questionnaires were related to the exhibition as a whole[5]. Viewer behaviour, conversation and comments were observed during the preview evening.

The specific feedback sessions were set up in a dedicated room in the University, with multiple copies of the work set up on computers. Viewers were invited, by email, from the schools of Computing and Fine Art. These included staff, undergraduates and postgraduates. A short questionnaire was used as a device to focus viewer attention on specific areas[6], but useful feedback was also gained from observation and overhearing of viewer behaviour and comment. Feedback was also elicited online, through a large number of discussion lists in areas related to the practice and using a specially created website. This proved unsuccessful due to the nature of the work itself. Works were not intended for network distribution and proved large, difficult for many respondents to access and unsympathetic to a long engagement.

The feedback collected was not intended to represent statistically significant data, but rather to gain an impression of how the work was received and help point out any difficulties with the mechanics of interaction and the more basic elements of communication, so they could be corrected. Thus the study is ultimately centred on the medium and its nature, and is therefore grounded in practice. It is informed by current critical theory, and seeks to pull elements from different bodies of critical thought to establish a personal and embodied relationship with a reinterpreted medium.

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[4] "What is this piece about?" "How does it make you feel?" "What do you think about it?"
[5] see Appendix 2
[6] see Appendix 3

This study includes a comprehensive overview of current research in the field. Also of importance is ongoing research in the related areas of Audience Studies[7]. This is now moving towards the specific study of audience reception of interactive artworks and forms an important aspect of determining the success of interactive artworks and recognises the role of the viewer in this process. Ongoing studies such as the Canadian Heritage Information Network's market research[8] and qualitative and quantitative analyses of audience responses aired at the recent Engage conference[9] will bring invaluable information to the field. Research from the perspective of the curation and archiving of interactive artworks is being conducted through the Daniel Langlois Foundation, the Banff New Media Institute and ZKM[10], among others; an overview is maintained by CRUMB[11].

Structure

The form of this report attempts to convey the simultaneity of the theoretical and practical aspects of the study, represented in figure 5 overleaf.

Chapter 2: The State of the Art: examines the nature of interactivity in a Fine Art context. It looks at the historical and contemporary models of interaction which exist there, and the relationships between them. It examines the different genealogies posited for Interactive Art and New Media, and relevant models from other disciplines which may be useful in trying to establish a specificity for the medium of interactive art.

Chapter 3: Types and Roles of Interactivity: looks at common models of interactivity, as identified through existing taxonomies and critical writing. It suggests ways in which these might be useful in the development of my own practice, exploring practical models and how they may be employed on the individual studio practice scale at which this study is aimed.

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[7] Audience Studies in art and how viewers engage with it is discussed in Chapter 3.
[8] Berman 2005- information on the pilot study can be found at www.davidberman.com/ CHINDigitalArtAudiencesLiteratureReviewandMethodologyBerman20050418.pdf
[9] Engage06 - the 4th Creativity and Cognition Symposium explores specifically audience experiences of interactive work from museological, curatorial, theoretical perspectives. www.creativityandcognition/engage06/
[10] http://www.fondation-langlois.org/; http://www.banffcentre.co/bnmi; http:/on1zkm.de/zkm/e
[11] Curatorial Resource for Upstart Media Bliss at http://www.newmedia.sunderland.ac.uk/crumb

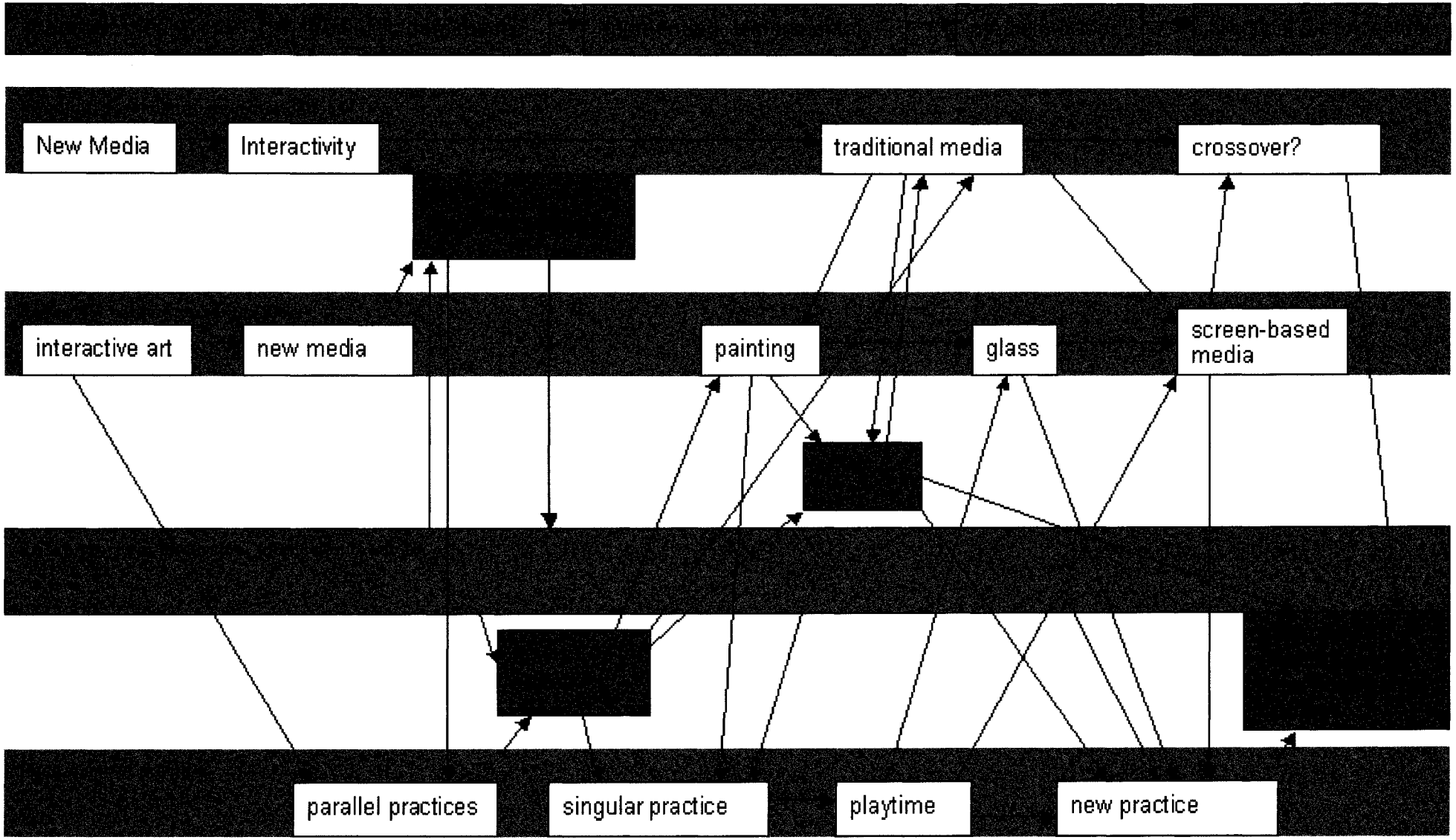

Figure 4: Genealogy of Research

Chapter 4: What is Wrong With This Picture? explores key tensions and incompatibilities both within current critical theories of New Media, and between these theories and my own emergent practice. These include differing conceptual models of interactivity, the emphasis on interpersonal interaction between viewers rather than between work and viewer, and problems with 'guerrilla' interaction. They include an emphasis on technology and a privileging of the theoretical and intellectual over the purely visual, the practical and the emotional. This then impacts on how the visual and the behavioural, or interactive, fit together. Tensions are also uncovered between notions of playfulness and deep engagement; and between the de-emphasis of meaning, and the viewer's concern for it.

Chapter 5: Early Work and Interaction Models: looks at the earlier practice which centred on interactivity, and the construction of relatively complex systems of interaction which develop over time. These attempted to build from the models identified in chapter 3. Chapter 5 includes further reflections on these roles, and an assessment of the successes and failures of the work in relation to them. It also identifies some shifts in the direction and conceptual model of the research.

Chapter 6:Answers - Interactive Painting: examines the current condition of Painting and the possibility of developing the practice as Interactive Painting. It examines later works in the practice following its development into a more simplified interaction, and greater concentration on the visual. Through the successes and failures of these later works it explores the nature of the medium and its essential qualities, and attempts to identify and develop a visual and behavioural language for Interactive Painting.

Chapter 7: Successes and failures: re-addresses the original research questions in the light of the body of practice, and identifies successful models which offer answers. It suggests a possible medium specificity for Interactive Painting in distinction to other related media, and directions in which this might develop.

2. The State of the Art

> "There is no Grand Unified Theory of Interactivity"
> (Polaine, 2005)

Fine Art does not have an agreement on a single definition of good interactivity; rather, it entertains a number of significant disagreements and discords concerning the type, amount, conceptual models and ethics of interactivity. These can be related to different emphases on the contextualisation of interactive art, which does not exist as one specific genre. Many writers identify two key characteristics of New Media: interactivity (Lister et al 2003, Gere 2002,Grau 2003), and variability (Manovich 2001. The latter posits human-work interaction as a means to create an individual instance: a personalised, customised artwork. New Media has generated a number of key texts, many of them collected in the New Media Reader (Wardrip-Fruin & Montford, 2000). However, much of the critical debate is still practitioner-led and is located on the internet at, or in the archives of discussion lists including Rhizome, NetTime, New Media Curating, and Irational.

Whilst earlier writers specifically addressed questions of interactivity (Huhtamo 1995, Sims 1997, Graham 1996, 1997), theory has become more centred upon New Media as the dominant genre. Interactivity has been de-emphasised, for example by the 2004 Transmediale festival's removal of its interactive category definitions to concentrate more generally on the defining boundaries of traditional and emergent art practice[12]. Notable exceptions to this, writing specifically on interactivity, are Polaine (2005) and Peacock (2001). The interdisciplinary, hybrid nature of New Media allows concepts and criteria from diverse disciplines and fields to be applied to artworks, and suggests that an analysis of interactive models from a range of disciplines would usefully inform this study. These often have a more prescriptive attitude, making concrete recommendations for achieving good quality interaction or experience. However, there is no precise agreement amongst writers or viewers and artists themselves on the context in which we should, and more importantly do, view

[12] see the Call for Entries, Transmediale Festival, (15 September 2004) archived online at http:\\www.transmediale.de/05/pdf/tm05_call.pdf

these works. This uncertainty is increased by the shift of much New Media out of the gallery and onto the web, the festivals and the streets.

Art and Interactivity

Art history already assumes basic models of interacting with artworks as communicative or emotive objects or processes - cognitive and participatory. These map loosely onto notions of 'high' or elitist and 'low' or democratic art. In addition, the notion of interpretation is often conflated with the model of participation, offering a model of explicit, discursive and active participation based on an educational model, which informs both gallery-based interpretive initiatives, and socially-engaged practice: an explicit interpretive interaction. Physical interaction - with a virtual or hybrid object in which some action by the viewer produces a visible or audible response in the work - is a less common model before the introduction of enabling computer technologies.

Cognitive Interaction

> "In one sense we recognise that all art is interactive...experience and meaning are the product of a negotiation between the viewer and the viewed" (Ascott, 2002:2)

Cognitive interaction assumes a viewer's response to a static image, such as a painting, changes over time, giving the impression of shifts in the image itself in the process of active viewing. Kester (2004) suggests that what the viewer interacts with here is neither beauty nor information but ideas, the work acting as a catalyst for the re-creation of experiences and generation of ideas. This process is characterised by Appleton (2002) as essentially internal, private and active. This 'gap', waiting for the viewer to fill it with a scripted but apparently spontaneous shock of recognition, suggests a leading of the viewer into the hidden depth of the work. Postmodernism puts forward the notion rather of exchange and dialogue, developing over time, and resulting in a fluid, open meaning. This is characterised by Jameson as the disappearance of reference and reality altogether, leaving only a

> "pure and random play of signifiers" (Jameson, 1991:96)

Participatory Interaction: Socially-Engaged Practice

Socially-Engaged Practice (the art formerly known as Community Arts) offers a paradigm of collaboration and co-creation; of experiential and empowered,

participatory engagement with a process, rather than an object. The notions of object, commodity, control and authorship are defined in opposition to those in a traditional fine art paradigm, and historically the two disciplines have been seen as very different. This model foregrounds participants' creative input and experience, while the artist adopts a role of facilitator, teacher, co-ordinator or experience designer. The meaning (and any narrative content) is produced by the participants; although this may fit the artist 's (or funder's) metanarrative.

Mail Art offers a model of template based, open-submission or curatorial works into which participants can slot their personal contribution. Often rooted in artist collaboration, this inhabits a liminal space between Socially-Engaged and Fine Art models, between process and product. Privileging individual narratives, this offers an early model of Database Art which, when taken onto the web broadens and diversifies the participant profile. Margot Lovejoy's web-based *Turns*[13] offers a good example of participatory art as a means of validating individual viewers' experiences through a sharing of personal narratives, which can be uploaded, searched by theme, read and responded to. This is offset by apparently unmoderated, disrespectful comments from other viewers which tend to undermine their power. Jenny Holzer's *Please Change Beliefs*[14], which takes onto the web and opens for public input her series of site specific, text-based *Truisms*, retains more artistic control, shifting the tense balance from process (truth) towards product (design).

Community Theatre, as exemplified by Boal's Theatre of the Oppressed, offers a philosophical model of participation in which the participant becomes both author and performer; rather than interacting with it, she becomes the work (Boal 1997). This work in turn has a spectator, and there is an important distinction between interacting with the process of creating a piece, and interacting with the piece itself, which is often blurred in New Media models.

Participatory Interaction: Performance

Live Art has a similar model of participation-as-performance. These participatory artworks may be formally similar to Socially-Engaged Practice, but

[13] http://www.myturningpoint.com for the sake of clarity, titles of artworks - including works produced in the course of the study, are all given in italics
[14] http://adaweb.com/project/holzer/cgi/pcb.cgi

shift the balance of power, or restrict levels and temporal stages of viewer's creative input. The development of a community or group identity may be short-term, and bands of participation level may be increased. In Nina Pope and Karen Guthrie's *Broadcast (29 Pilgrims, 29 Tales)*[15], Reynolds (2001) identifies six hierarchical levels of participation, from the participant-performers (the 'pilgrims') to those who experienced the work only through documentation. Each level of participant-viewer experiences the work through the mediation of the performance of the preceding levels, an important dimension in interactive works. The artists identified this not as Community Art, but a collaboration between themselves - as designers of an event - and the 29 pilgrims they selected to make journeys and report on them.

Theatre does not share Art's current existentialist fears about the death of the author, nor confer co-authorship onto audiences, but it acknowledges the important and different contribution they make. It offers a valuable model of participation within strictly proscribed limits, which preserve the essential structure and narrative unchanged, but still offer genuine involvement in an experience. Interaction with live performance may be very subtle (a communication of mood and receptiveness), highly ritualised and formulaic (pantomime) or scripted, with one volunteer-performer standing in for the whole audience. This principle, of a minimal action but a significant emotional engagement, is also established within Experience Design, which tends to conflate participation, involvement, and interactivity with simple presence at a spectacle. Hughes (2000) establishes the important benchmark here as not the amount, but the perceived amount, of interactivity. The viewer, immersed in rich, time-based visual, aural and tactile stimuli, perceives that she is actively participating in something.

> "What you create is a carnival, and being here is often participation enough" (Hughes 2000:178)

Shedroff (2001) characterises this as a dramatic narrative between the viewer and the experience as a whole - a useful model for viewing the artwork as single, integrated or holistic.

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[15] archived at http://www.somewhere.org.uk/broadcast/

While audience participation in the theatre seldom influences plot outcomes, the TV principle of audience voting or viewer phone-in permits offers viewer choice to influence results. Paul Vanouse & Peter Weyhrauch's *Consensual Fantasy Engine*[16] developed this model to determine branching in a narrative film, using audience response to obliquely related questions to select from a database of film clips concerning the O J Simpson trial. More recent experiments in Interactive Theatre which compare the use of buttons to effect plot change, with performances in which subtle shifts in dialogue and feedback are based on audience response (laughter, shuffling, interruptions) suggest the latter to be more involving and engaging. Such interactions recognise the individuality of the audience member, and the collective personality of the audience. The mechanisms here are highly intuitive and transparent - thus seeming to resonate suddenly, and surprisingly, with the individual's idea or experience (Gislen, 2000). In a fine art context, this suggests the idea of magic - of objects having a magical power to recognise, respond to and affect the viewer, undercutting her logic or intellectual disbelief.

Participatory Interaction: Fandom

Fandom is characterised by Baym as impersonation (identifying, engaging with and embodying) and improvisation (altering or re-inventing) around characters and plots in the original medium, thereby creating new narratives. (Baym 2000) This can be seen as real grass-roots participation, spontaneous and participant-led. It has proved so successful in such notable examples as the *Rocky Horror Show* (O'Brien 1975) that it has formed communities, motivated independent and collective action and original cultural production, and has become re-incorporated into the originally non-interactive artform. The ritualised participation is not truly dialogic, but affects the meaning of the experience and interprets the meaning of the work. Both participation in the show itself, and wider web-based and social interaction function as both a signifier of 'belonging' and a mechanism for developing and strengthening the fan community (Piro, 2004). A similar process is described in the realm of tribute bands and impersonators by Nightingale (1994). Insider-based fan communities operate in popular, 'low' culture providing shared and negotiated interpretation, and

[16] exhibited at Walker Art Gallery 1998. Vanouse's interview with Steve Dietz is archived at http://www.walkerart.org/archive/B/B9737110527412566169.htm

producing artwork, slash fiction, filking[17] and related artefacts. (Jenkins, 1992; Green, Jenkins and Jenkins 1998) The viewer's identification with this community reciprocally affects the interpretation of the presentation and of her real life (Gillespie, 1995). This model offers a high degree of viewer autonomy and a tangible, physical form for their cognitive interaction with ideas and concepts interpretation. It is hard to transfer to non-networked art projects, although it was used in early online world (MUSH) projects such as Pope and Guthrie's *Island*[18], with its accompanying installation of a 3D model of the designed world.

Interpretation

The agendas of galleries and funders often conflate the notions of participation with that of learning and interpretation, while Socially-Engaged Practice often views Art as a broadly learning and self-developmental process. Interaction as a way of interpreting and understanding is in fact an important element of viewer engagement. An educational model of interaction is useful in considering an artwork as a communicative object, facilitating the development of ideas, and the viewer's understanding of the art object's intrinsic nature.

Gallery-based art assumes the mediation of experts, and is experienced and understood through the filter of curation, textual explanation, discussion, and activities outside the control of the artist. This includes the use of interpretive interactives such as those pioneered in Gallery 33, Birmingham and Cartwright Hall, Bradford. Godfrey (2002) describes these as primary tools for equipping the visitor with ways of looking at Art, thereby increasing their enjoyment and understanding. She found successful interactives offered viewers validation for their feelings, including confusion, and created a safe place for experimentation. Interestingly, she observed that those works supported by these interactives failed to provide a similar level of playful engagement.

In a gallery context, small-scale interactive artworks might be confused with, or engaged with by viewers as, interpretive interactives. Thus viewers would apply different questions and criteria to the works, and seek a different type of

[17] filking: the production of filk songs or fan-produced folk songs related to the original cultural output (named from a typographic error)
[18] http://www.somewhere.org.uk/islandinfo/

engagement. Jane Prophet's Technosphere, developed from an online a-life world as a stand-alone interactive at Bradford's NMPFTV, allows viewers to design and track creatures as they compete for survival. A visually and behaviourally very similar piece, *The Evolving Sea,* built by Atacama for The Deep Submarium in Hull, is an educational game based on aspects of evolution, and typifies this confusion.

Figure 5: Jane Prophet: Technosphere

This similarity could be used to offer artist control of interpretation, and offer increased levels of context. This model is already used in some galleries' websites, where extensive artist comment, annotation and interview support an exhibition[19]. The interpretation could become explicit and incorporated into the work. As a model this is troublesome; it may become overly didactic, or impose a functional aesthetic; it may compromise or subsume the artwork, prompting viewers to shortcut the exploration process in the manner of fan-site 'spoilers'. However it could also offer a model for allowing 'fan' input on several levels. It may circumvent the problem identified by Heath and Vom Lehn (2002) of gallery visitors failing to connect information in interpretive interactives with the related artefacts. More importantly it would place the interpretation on a level with the work - flattening out the 'expert' voice into the voice of the work itself.

Physical Interaction

Physical interactivity implies that the viewer can make some permanent, or temporary, changes to the physical form of the work through their intentional action. 'Interactive' has been used as a concept to describe non-computer-based works. These include sculptures which are moved by viewer's intentional or unintentional act, such as Alexander Calder's *Mobiles*, which might be moved

[19] see, for example the BT series of interactive videos at www.tate.org.uk/btseries and Tate Gallery's Works in Focus www.tate.org.uk/learning/learnonline/infocus.htm

by viewer movement or breath; and installations such as Sonya Rapoport's *Objects on My Dresser*[20], in which viewers can rearrange physical elements on a drawn web, giving concrete form to links they perceive between objects and ideas. It also includes works which require physical effort in order to view them. Gustav Metzger's *Historic Photographs: To Crawl Into*[21] represents Viennese Jews being forced to scrub pavements, on their knees. The viewer must crawl under a tarpaulin and over the work in order to view it. Thus he uses physical action to reinforce the image's narrative and power, requiring the viewer to invest and offering an experience that is at once physical, intimate and demeaning. Similar ideas can be seen in Frederick Kiesler's exhibition designs for the Surrealists[22], which required viewers to become active, physically altering frames and displays, and using the literal viewpoint in an attempt to influence the metaphorical one.

The development of enabling technologies allowed computer-based interactive works to offer safety (both for the viewer and the work) for exploring physical interactivity. Early 'Multimedia' works, employed single-screen, simple point-and-click interactivity, often with an informational or video-based aesthetic. Huhtamo (1996) provides a useful snapshot of the state of the art at this point. Screen-based works in galleries are now uncommon outside of festivals, and the (largely unsuccessful) temporary re-siting of net.art works, where they lose their context, and so much of their power[23]. Interactive Art has largely been subsumed into New Media, and developed in two general directions: large-scale installations and net.art.

The installation model can be seen as a development of gallery-based performance, actuation and site-specific pageant involving audience participation. They include models of artwork-person interaction, artwork-group and person-person interaction. Often, these are hybrid (virtual and physical) objects, and adopt intuitive, gesture-based interfaces. They may involve complex programming and equipment, specially created input mechanisms, or

[20] 1980 archived at Interactive Art Conference http://www.well.com/~couey/interactive/guests.html
[21] Hayward Gallery, "How to Improve the World - 60 years of British Art" November 2006
[22] Kiesler *"Designs for Art of the Century"* (1924-47) Peggy Guggenheim Museum, Venice 2004.
[23] Good Examples are ZKM's "Net_ Condition"(1999), and the Tate's "Art and Money Online"(2001). These shows were criticised - for example, by the consensus at the Baltic Seminar on New Media Curating, 2001 - on this basis.

artificial life. This area is less highly theorised and critiqued than net.art, in spite of being easier to objectify and contextualise within the existing art machine. This may be due to galleries finding large-scale interactive installation difficult to install, expensive and hard to maintain; and inadequately provided for by practical curatorial training.

Net.art is the more dominant model - both in literature and practice. It is regarded not only as typifying and representing the digital condition, and communication aesthetic, but also as an embodiment of distributed creativity and dispersed authorship, and the rewriting of the viewer-artist-artwork relationships. The dominant critical models of net.art privilege human connectivity and collaboration, human-human interaction facilitated through art, which can be seen as a development of both performative and socially-engaged participatory models. The model of artist as activist, as creator of social interventions, issuing a call-to-action via networked technology is described by Blais and Ippolito (2006). An overview of net.art as manifesto is offered by Bookchin and Shulgin (1999). Ross (1999) also identifies the notion of discursive interactivity embedded into the work, and the collapsing of distinctions between generative and critical dialogue. These views tend to redefine the artist as experimenter: as collector, facilitator, and celebrator of ideas emerging throughout the community.

The net also represents an accessible self-exhibiting and self-curating arena, a repository of open-source materials and tools, and meeting space for potential collaborators[24]. This reflects an extension of artists' drive to take control of the art, and its distribution, from the curators. The net has enabled a growth in self-theorisation as a means to achieve interpretive control. Blogging has become a way for artists to discuss their work in their own language and disseminate their writing widely, whilst maintaining the link between the discourse and the work. Thus, the net has become a distribution platform for other artist output - playable works, animations, static photographic works and documentations. The simplification of enabling technologies and user-friendly softwares such as

[24] see, for example, OPUS- a (http://www.opuscommons.net/) and AID -the Art Interface Device offering accessible tools for artists to create and co-create interactive installations (http://interaccess.org/aid/).

Flash[25] has brought a proliferation of interactive objects disseminated via the net[26], including what might be regarded as 21st century Folk Art, but also the annexing of art objects and games for advertising and 'edutainment'. In practice therefore, it is difficult to anticipate how the viewer might contextualise these artefacts, since this is influenced by the real-world context (home, office, university seminar, cybercafe) and the viewer's curation of her experience from site to site.

A small number of artists produce stand-alone screen-based interactives using standard controls. Notable here is the work of Scott Snibbe, and Mark Napier - whose works rely on complex algorithms behind simple click-and-drag vector interfaces, often of a hypnotic, fluid and abstract beauty. These are disseminated via the web but also in gallery-based exhibitions. Also notable is a group of artists whose work relates to a French style of Web Cinema, and to a wider context of European-based collectives working in animation, some of it interactive. This includes Nicolas Clauss, Jean-Jacques Birgé, Frédéric Durieu[27], Antoine Schmitt[28]. Durieu and Schmitt work with complex algorithms describing and reproducing movement, while Clauss and Birgé's works[29] derive from the visual, resembling abstracted photo-collages with sound. These are disseminated via the web, but do not use its networked capability as an element of the work or its interactivity. These artists are not generally foregrounded in New Media theory - although Barry (2003) includes them in an overview of web Cinema - and appear unfashionably outside the dominant New Media aesthetic, in spite of having been selected by Fluxus[30], Fifi[31] or the Seoul Net Festival[32].

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[25] Macromedia - now owned by Adobe
[26] see, for example, the excellent "Nobody Here" http://www.nobodyhere.com/justme, a self-contained site of navigable and occasionally interactive graphics; or www.2dplay.com - a repository of open-submission games and short animations
[27] work can be seen online at http://www.lecielestbleu.com/
[28] online works can be seen at http://www.gratin.org/
[29] both artists' work can be seen at http://www.flyingpuppet.com/
[30] www.fluxusonline.com
[31] www.Fififestival.net - expanding in 2006 to encompass mobile cinema and video games
[32] www.senef.net - has a category for interactive works

Genealogies of Interactive Art

Technology

Models of interactivity can be seen as derived from the trajectory through Art (and other) History which is assumed. Spalter (1999) and King (2002) trace its development from Computer-based Art, generally regarded as starting in the mid-fifties. Early works were driven by exploration of the power and ability of the computer, often produced by Computer Scientists or Mathematicians such as Franke, Laposky and Noll. One strand of New Media follows this line through increasingly complex enabling technologies, and increasingly complex mechanisms predicated upon collaboration and skill sharing. The traditional Computer Science model of interaction as task-driven command-and-response has suggested a Fine Art model of interactive as a tool, toy, or musical instrument to be played with. There is a parallel here with the developing VJ phenomenon, incorporating 'playable images'. Ascott has suggested that interactive artwork should be conceptualised not as autonomous work but a tool for others' creative activity,

> "a sort of behavioural Tarot pack...a matrix for ideas and feelings" (Ascott 1967: 99).

Jordan and Packer (2001) also explore New Media as an interplay between Art and Science, which arguably follows the tradition of artists using machinery (for example, Jean Tinguely's self-destructing machines), automatic or random processes (such as Hans Arp's, randomly-positioned collaged pieces in *According to the Laws of Chance*), through *Experiments in Art and Technology* and art-science collaborations such as *Digital Art Weeks* and *Sciart*[33]. The linking of Art with Science or Computing introduces a number of problem areas. The emphasis on technology has de-emphasised the visual in favour of the computational, a situation exacerbated by early limitations of memory, process and network distribution which tended to privilege text- and vector-based visual forms.

Computing emphasises the need for the user to divine intuitively the causal link between action and resultant system behaviour, via Norman's concepts of

[33] Digital Art Weeks ETH Zurich, www.digitalartweeks.ethz.ch. Sciart, The Wellcome Trust www.wellcome.ac.uk/node2530.html

perceived affordance and transparency, allowing the user to make informed decisions. Usability gurus such as Nielson position the system as servant to the user; the system must therefore speak the language of the user (Preece, Rogers & Sharp 2002). This is in contradiction to the Art model which traditionally has required the viewer to learn the language of the work. Nielson and Norman represent a Structuralist view of interactivity as a layer separate from the task or content. This model therefore presents a problematic separation of the behaviour from the visual. While Computer Science searches for an ever-more transparent interface to an invisible virtuality, Art foregrounds the materiality and affect of the interface, moving increasingly away from the early Multimedia models of content-plus-interaction, to interaction for its own sake.

Beyond the simple command-and-response paradigm, Computing strives towards a model of communicative interaction based on the human conversation; the emulation of life, and reciprocal interactivity with an intentioned, learning entity. Graham (1997) and Stone (1996) suggest this model for Art, with its capacity for graceful degradation, mutual interruptability, limited look-ahead, open-endedness and subtleties of connoted meaning. Stone characterises interactivity as a mutual and spontaneous discourse between two conscious agents. Developments in computer technology have not yet permitted computer-based systems to interpret unrestricted natural language, nor satisfactorily pass the Turing test[34]. The high standards demanded of this model have led many to conclude that meaningful dialogue is not possible between human and computer. Campbell (2000) and Chapman and Chapman (2002) argue that meaningful dialogue can only occur between viewer and viewer, or in the work's reflections of the viewer's responses.

This frustration at the failure of computer intelligence, the strategic problems of curating and exhibiting large-scale interactive works, and the difficulties of actualising them as a single artist without the support of research teams, funding or space have been factors in leading artists away from stand-alone, artwork-human interactives toward human-human communicative technology.

[34] Turing proposed in 1950 an imitation game in which a computer attempted to pass for human in a text-based conversational exchange. A copy of his paper "Computing Machinery and Intelligence" can be accessed online at www.abelard.org/turpap/turpap.htm

This is also supported by the theoretical move away from art objects towards a digital aesthetic of connectivity, collaboration and dispersion.

Wilson (1993a) described three possible artist stances to technology: Modernist, assimilating technology as a new medium for expression; De-constructionist, highly theoreticised, and reflexive; and Transdisciplinary - exploring the technology's culturally transformative possibilities. These distinctions are reiterated as current challenges by Paul (2002), and can be regarded as continua. Penny (1998), for example, suggested a distinction be made between works adopting a cybernetic, Pavlovian model of input-output and human-thinking-like-machine; and those adopting a biological or evolutionary, machine-thinking-like-human model, adopting a harmony in parallel to nature. My own position and practice can be seen as assimilating technology, attempting to discover its potential in a visual and behavioural, rather than a philosophical context; but containing comment on the use and condition of technology. It tries to create human-friendly - biological - models, casting work as not in terms of input-output at all, but rather of exploration or journey, and of comprehensible actions (make the fans chant, to encourage the players who will then score a goal[35]). My position is inevitably informed by my experience within Computer Science but places its hope of cultural transformation in the context of Art as a catalyst for individual idea and action, rather than the technology as vehicle for group action. It represents a possible Feminist stance that

> "One way to bring about the revolution is to assume it has already happened and live accordingly"[36].

Digitality

Digital and interactive work is contextualised within the digital zeitgeist - the increasing interactivity, virtuality, simultaneity, non-linearity and interconnectedness of the culture as a whole, and the interface as the dominant cultural form. New Media here assumes a distributed aesthetic, socially networked and database-driven aesthetic of process, product and experience. This is underpinned by notions of a rhizomatic, diffused intellect, and by the

[35] This example refers to *Faith*, in which rolling over images of mouths causes them to open and sing - after a simple algorithm counts enough singing per unit of time, the system registers 'goal' and provides lights, flags and cheering

[36] McMorran, F personal correspondence to S.M Kenney 2006

model of Socially-Engaged Practice, with its tensions between process and form, and between the ability to engage freely in meaningful interaction, and the notion of artistic control.

Gere (2002) sites Digital Art in a context of interactive culture, and a Utopian search for interconnectivity and self-realisation. This privileges interactivity between people (intersubjectivity) over simpler human-object models, and an aesthetic of resistance. This reading of interactive art supports the open meaning, or absence of meaning and a playfulness, loss of individuality and the anonymity of multiple, shared, identities. This loss of individuality undermines the idea of a personal and emotional engagement.

Manovich (2001) and Stafford (2005) have suggested that a fragmentary and non-linear, anti-narrative form is the only way to reflect the fragmented digital condition, and the experience of the viewer in a world of the fleeting and simultaneous. Manovich's database structure in particular suggests the artwork as encyclopaedia, with unverified content from a number of unidentified sources; a huge but ultimately closed loop, reflecting existing information and misinformation, without distinguishing between the two. Indeed, it queries the notion of misinformation, separating 'information' from 'truth'. This privileging of the essential fragmentary nature of digitality, however, denies the human tendency to impose narrative, and the therapeutic possibility of using Art to make sense of, to create form or narrative out of, that which seems formless. Art must reflect its time, but not unquestioningly; it must also critique. The digital age represents many shifts: in climate, in concepts of family, childhood, personal freedoms, and in the ways in which the constants of human life (the need for love, the search for meaning or self, the reliance on some form of deity) have shifted around them. Blais and Ippolito's casting of Art as the antibody to technology's virus is interesting here. It suggests a reversal: shared characteristics but ultimately a different effect, using Art to explore the symbiotic relationship between technology and the social body, and misusing technology for

> "tearing apart and rebuilding... society's vision of itself" (Blais and Ippolito, 2006:7)

Play

Fun, as Crockett (2005) points out, has not historically been highly regarded in formal academic critiques of Art. Now, play and the value of subjective pleasure emerge as key criteria for interaction within New Media, not only from the digital context, but also the technological and the immersive. Many artists and writers refer to the importance of the playful experience, and the model of the artwork as sensually pleasurable plaything, offering free, creative environments which go beyond aesthetic enjoyment. (Suchin, 1997; Graham, 1996; Dietz, 1998; Polaine, 2005). Hughes (2000) models interactive objects as toys - essentially pointless and without intrinsic meaning- and argues for critiquing them solely on the effectiveness with which they facilitate play. Deleuze and Guattari (1987) in their discussion of the nature of the digital, champion the open or smooth experiential space – which Caillois (1962) terms Paidia, tumultuous or spontaneous playfulness. This is in opposition to the closed or striated space of Ludus, governed by rules. This emphasis on play is problematic for practitioners coming from an essentially visual context. It does not allow for the important interplay between the emotive and seductive immersivity of the visual and the creativity of play; the inner and the outer. Consideration of play in art works also requires addressing the question:

> "what kind of fun are we supposed to be having?" (Graham, 1996: 155).

Jordan posits play as both physical manifestation of and facilitation for the free movement of the mind, validating the spontaneous impulses of the viewer, and realising Vannevar Bush's aim to create a machine which

> "supported the mind's process of free association in the act of creation". (Jordan, 2002 no pagination).

This suggests a model of Interactive Artwork as simulation in which ideas or possible meanings can be tested. Brecht's view on play is more seductive - an essential route to the irrational, which brings people to a realisation of the truth. (Brecht 1974) This suggests the role of the Shakespearean fool, in which the artist is permitted licence to insult, and debunk, in order to speak the truth in a palatable and comprehensible form, through laughter.

Play, whilst characterised as essentially free and spontaneous, still offers a model of interaction-with-object which combines cognitive interaction with a

multi-sensory exploration to develop a kinaesthetic or somatic understanding of the object and its behaviours. This seems an important model for interactive artworks - that of discovering the nature of the work through simple sensory interaction. If the interaction links the meaning or narrative to the activity then spontaneous playful works become communicative. Research into adult play is limited. Notable exceptions include Czikszentmihalyi (1990), who links play to the notion of 'flow' as an autotelic experience in which happiness and fulfilment are derived from engagement in creative development, and which helps to create an ordered sense of self. Altheide (2002) suggests play as a means for adults to rehearse roles, myths and anxieties about the real world, learning through simulation.

Gaver (2002) identified as a core element of play the creation of order or understanding through shifts between tension and resolution. This is an important model for the many tensions that emerge through this study. He characterises adults as 'Homo Ludus' - with a sense of curiosity and playfulness, and a love of diversion, exploration and invention. To communicate with these characteristics, he suggests that interactives be built to encourage meandering, and a sense of wonder. His recommendations for how this be achieved - idiosyncratic, subjective approaches, ambiguity and open-endedness, provocation and a grounding in personal experience - are suggestive of a Fine Art practice. My own practice has aimed for works which are intriguing, challenging; offer some sense of shock or wonder; have levels of meaning or exploration; and stimulate questions or present problems rather than necessarily offering closure.

Gaver suggests that

> "unless we start to respect the full range of values that make us human, the technologies we build are likely to be dull and uninteresting at best, and de-humanising at worst" (Gaver, 2001 no pagination)

Performative

Developments in participatory and performative art provide an important trajectory. Daniels (2002) and Gere (2002) trace the line of performative participation in Art, via Fluxus, which elicited (non-autonomous) viewer participation in an attempt to encourage identification with works and concepts, and subsequently reflect these back onto the viewer's own life. Interactivity here

is a means of personalisation and emotional identification, of deepening and strengthening the engagement. Art was also cast as a force for social change, through a process of socio-cultural-political examination and transformation; yet underpinned by playfulness. This development is traced through Happenings, the Lettristes, and Situationists, and Mail Art with its capacity for blurring, adding and altering meanings.

Birringer's Live Art perspective stresses the links between interaction and a line of development through Socially-Engaged Practice, site specificity and performance, centring on notions of process and the foregrounding of the sensory and physical over the linguistic. He describes a development from the flesh body to the constructed and abstracted body (Birringer, 2005). This echoes Hansen's philosophical casting of New Media as a development from image to body, from visual to haptic, and from perceptual to affective, corporally experienced embodied work (Hansen, 2004). This emphasis on process and embodiment conflicts with the Technology model of Post-Human. It offers a way to re-connect the body with the work, rather than the cyberfeminist model of escaping the material into Utopia[37].

Art

Paul (2002) traces Computer Art's history through Constructivism, Cubism, Op Art and Dada, informed by, and subsequently colonised by performance and video artists in the 70s and 80s. She establishes links between Performance and Video through shared concepts of time as medium, through their co-incidence in the practice of specific artists and the pragmatic use of video as documentation of Performance. Paul sites New Media in the realm of the performative, experiential and choreographic, linked therefore to Live Art.

As screen-based, New Media is placed firmly within the Film context by Manovich (2001, 2002) and Lovejoy (2004). This genealogy of New Media, aligning it with a transfer medium, de-emphasises the interactive. However, developments in enabling technologies have increased the potential for Film to become interactive. Research into Interactive Cinema, (notably by Davenport et

[37] see, for example, Kirkup, G et al (2000)*The Gendered Cyborg* London:Routlege on the relationships between technology, virtuality and gender.

al, 2000; Sparacino, Davenport and Pentland, 2000) and the related area of Interactive Storytelling (Pinhanez et al, 2000) relates the notion of performative interactivity to narrative, using distributed intelligence to create virtual actors or smart story parts. Davenport describes this as combining site-specific artwork, live theatre and the theme park. It offers dramatic coherence and immersion but is perceived by the disbelief-suspended viewer as open-ended; this offers high levels of emotional engagement and personalisation. More conventional developments in Interactive TV are described by Curran (2003) as a way of adding layers of information and related challenges to the existing screen output - importantly this is seen as not permitting alteration, but rather establishing an emotional connection and an active experience. This reflects the idea of an integrated interpretive interactivity.[38]

Grau (2003) emphasises the immersive aspects of the interactive, tracing a development from cave painting with its performative and ritual elements, through panoramas, Gesamtkunstwerk, and immersive film technology. All of these redefined the viewer/work relationship, but without necessarily implying physical interactivity. He follows the line through to immersive and interactive installations - the CAVE - with head- and location-tracking devices. Interactivity here is seen as a parameter of immersion, and works such as Mezger's fit into this development. Against this immersivity, Gere (2002) cites Minimalism as a springboard, wherein it is possible to trace a jump from the cognitive interaction of Rauschenberg's white paintings (as silence the viewer can fill) to the physical interactivity in Cage's *4'33"* as the performance of that which fills the silence. Indeed, the logical conclusion of the artist's retreat, stripping away content and form, is that the space must be filled by the viewer.

Bolter and Gromala (2003) suggest a basis for interactive art in the anamorphisms of Hans Holbein and his contemporaries, which required physical activity in order to view them properly. Some, like the secret anamorphic portraits used by the Jacobites[39] were not only immersive, but also associated with ritual, and community-membership. The immersion here implies not simply the passive observation of spectacle, but an active presence.

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[38] see page 24

[39] for example the portrait of Charles Edward Stewart at http://www.fort-william.net/museum/collections.htm

The absence of a holistic aesthetic for interactivity should offer the artist creative freedom to explore its potential. However, this lack of a finite critique has led critics into a concentration on a technological or philosophical aesthetic of functionality and process, innovation and skill, rather than an art-historical context. In an interdisciplinary context, many practitioners call for their work to be contextualised and critiqued simply as 'Art'. Bosma (2001) suggests that New Media needs to be examined in the context of Art History as a whole and not through Technology. Henry suggests quite simply

> "Maybe we should be more interested in how good it is rather than how interactive it is"(Henry, 2001, no pagination).

Arguments over the right context for critique and interpretation continue, for example at the *Refresh!* 2005 conference, and accompanying exhibition *The Art Formerly Known as New Media*. This emphasised the experiential and engagement aspects of the work rather than the technological, and suggested a view of the works as 'Art' with a unifying concern that

> "the important questions of art revolve around meaning not means, and especially, what it means to be human" (Cook & Dietz, 2005, no pagination)

This is supported by the jury statement for the Transmediale Festival 2006, which called for works that

> "Transcended their medium and spoke to us simply, powerfully, and with intelligence." (Transmediale, 2006, no pagination)

Currently, critical writing offers few comparisons between the formalities of interactive and other art. Biggs compares interactivity with Cubism as a way of trying to express and engage with multiple points of view simultaneously. Interactivity, he suggests

> " is not primarily to do with things like shared authorship...artists work with human consciousness and its representations. Viewers seek their image...in the work of art" (Biggs, 2001 no pagination)

As the genre matures, it may begin to be included in the broad canon of all artworks. Unusually in the context of critical writing on New Media, Blais and Ippolito (2006) acknowledge the essential plurality of Art; and that their own definition is only one among many of the art models which society should recognise and nurture.

In this context, examining the genealogy of my own interactive art practice, it is possible to trace a common thread of figuration and the sensual enjoyment of shape and texture, of passionate emotional involvement in the work, of energy - the importance of working directly with the hands and the materials and on a large scale, and of humour - often dark humour. A weakening of my own emotional engagement can be seen to coincide with a move into a computing context (the study of Multimedia) and the beginning of the shift into a computer-based art practice. Ironically, then, as the practice became more exclusively computer-based, it began to regain some of this emotional engagement. Though not aligned to any particular school or movement of art, the practice has been informed by artists such as Paula Rego and Frida Kahlo, by elements of realism, symbolism and feminism, and an unfashionable tendency to the narrative and issue-based. It has some sympathies with the Stuckists, but ultimately refuses all 'isms'. The transfer into working wholly with interactive media can be seen as a way to re-establish working on a grand scale, within the limitations of a small physical space, and a move to a looser, more abstract, less anxious visual style.

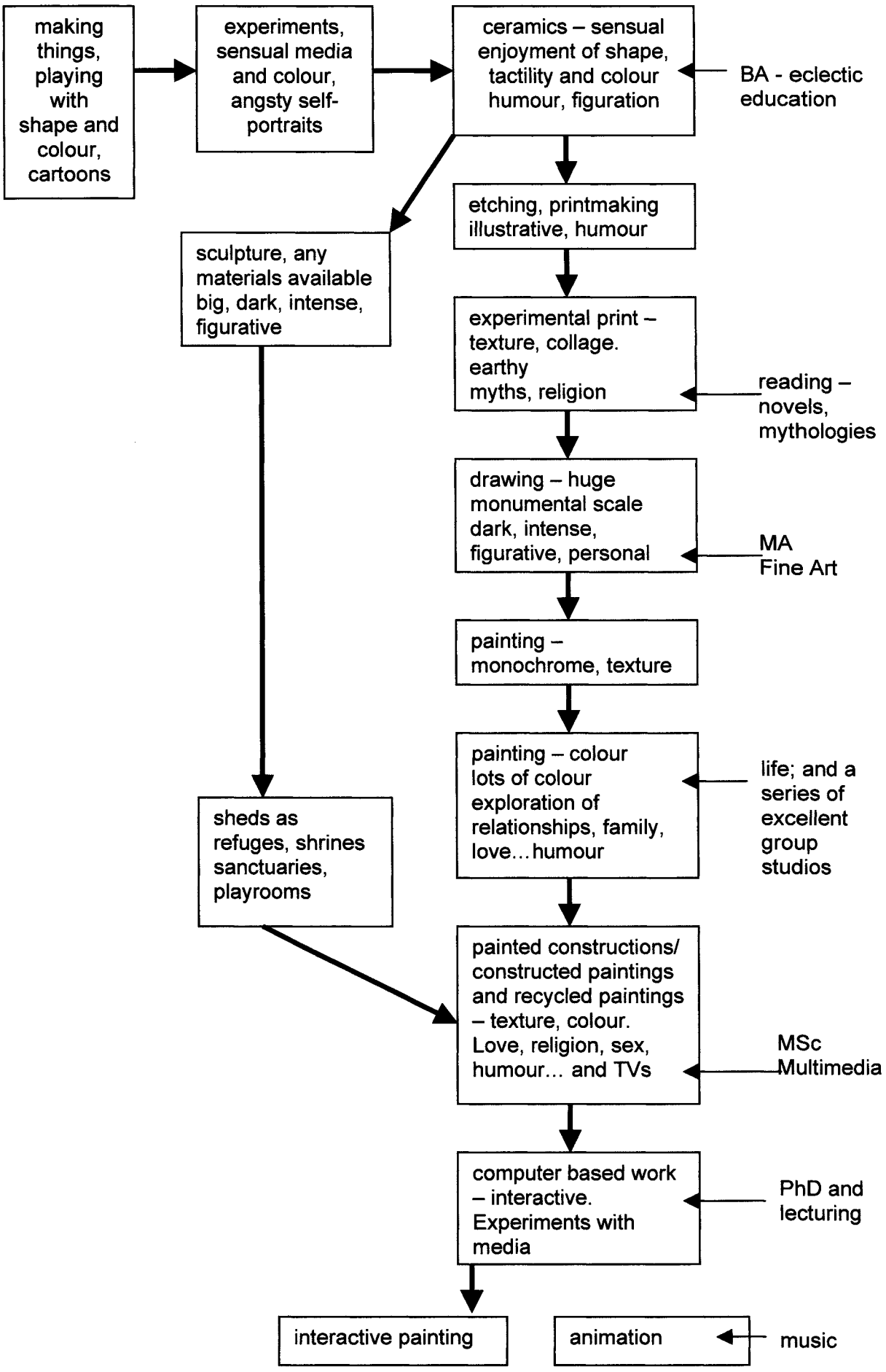

Figure 5: Genealogy of Art Practice

3. Types and Roles of Interactivity

How Interactive is Interactive?

A survey of existing taxonomies and recommendations was made (Bell, 1995; Jensen, 1997; Sims, 1997; Graham, 1997; McMillan & Downes, 2000; Morse, 2003; Wilson, 1993; Schwier & Misanchuk 1994; Corby, 2000; Iuppa, 2001, Sparacino, Davenport & Pentland, 2000; Shedroff, 2001a). This identified common areas of concern, although different terminologies. These classifications are not related to the notion of accessing and understanding meaning, although some do touch on emotional affect and passion.
Jensen, the most detailed, provides a useful overview of 1-, 2- and 3-dimensional scales for the measurement of interactivity, based on modelling extent, amount and significance of choice. Bell, although technology-centred, is informed by the early enthusiasm for interactivity and includes some conceptual parameters. He also includes a consideration of the extent to which the work permits and encourages reflection. This is an insightful inclusion, particularly important in terms of the work's communicative potential. He does not however offer pointers as to how this may be extended.

Peacock (2001) defines elements of a texture of interactivity. This would offer an experience encompassing sensation and action, and elements of play, of puzzlement and understanding, anticipation and reward, concentration and understanding, engagement and dialogue. Graham (1997) also offers the notion of charting the changing dynamics of interactivity with a work over time, which Penny (2001) suggests are viewed as spatial and temporal choreographies related to Sculpture and Dance. Works would then be designed with a consideration of possible narrative flows, and tensions between levels of intensity, speed, depth and of types of gesture, action and activity. The development of a behavioural or interactive aesthetic would require a mapping of the modalities and conceptualisations of interaction dynamics, and a consideration of how these integrate into the work and its meaning. This notion of a flowing choreography fits well with a practice rooted in the physical, and the sensual.

Utterback (2002) suggested that the types of interactivity and of action which are possible build a grammar by means of which the potential for meaning is determined. The notion of interactivity as a language which shapes thought reflects the founding statement of the European Digital Artisan's Network, on the need to develop an understanding of the language of interactivity, its forms and rhetoric and the kinds of viewer role and positionality it offers (EDAN, 1995). Some members of EDAN - self-defined as artists and designers - went on to form ANTIRom, with a mission to try to understand what made an interactive experience engaging. They found this

> "surprisingly difficult to answer". (ANTIRom, 1995, no pagination)

From ANTIRom, Polaine (2005) went on to research the principles of interactivity, using theories of play and flow to examine the moment of interaction, and championing those works in which the interaction, the content and the technology are inseparable as part of the experience. He is currently (in 2006) engaged on a PhD at the University of New South Wales around developing a taxonomy and language of interactivity.

A debate conducted online through the New Media Curating discussion list, CRUMB (September-October 2004) uncovered important differences of opinion concerning taxonomies and vocabularies for New Media and interactivity. It suggested that the development of a hierarchical taxonomy is not universally welcomed or needed, although a wish for a shared critical vocabulary did emerge. This is being taken forward by Graham (2005) as a taxonomy for New Media, though not specifically for interactivity.

This study was initially intended to include some developments of taxonomy related to interactivity, but it was felt that this replicated work being done elsewhere, and drew the focus too far away from the practical. It is anticipated rather that some elements of terminology will be identified which will inform descriptions and discourse of interactivity. The taxonomies revealed a number of key models and formal, aesthetic and conceptual qualities of interactivity, from which the following have been extracted as relevant and useful.

Immersivity

An important quality identified was whether a work is immersive - grand-scale installation - or intimate. Lunenfeld (2001) describes immersivity in terms of the experiential, arising out of viewer input and investment. Corby (2002) suggests two types of immersion - the physical (overwhelming, seductive, sensory/sensual) and the psychological (the viewer engaged in a constructive relationship with the work). The latter is an important distinction since it allows for an intimate immersivity, based on a conceptual notion of filling the viewer's world, rather than the spectacular experience. The sensuous dimension is important to considerations of the interactive artwork's affective ability. The discipline of Games Design is more outspoken on this, on the need for facilitating the visceral thrill of speed, of immediacy, and power "providing an exhilarating blast of the animal emotions" (Poole, 2000:235) and for allowing the player to "revel unashamed in the joy of destruction" (ibid: 240). Between the spectacular and the intimate, Biggs (2003) argues the intimate is the more successful form of interactivity, being more personal and offering the greater possibility of identification. Steiner (1997) suggests that Art's communicative ability is tied to the combination of the seductive and revelatory, via an immersive and sensual experience that is essentially solitary.

Roles and Conceptualisations of Viewer and Artwork

An important question is how the viewer perceives the role, purpose or model of the artwork, and her own role within that. The relative lack of small-scale interactive works in galleries makes this problematic. The Research Centre for Museums and Galleries (2001) found that adult visitors conceptualised gallery-based interactives as games or educational applications - they did not use them because they felt they were aimed at children. This affects the viewer's understanding of who (or what) is interacting with whom or what - and whether the experience is intended for one viewer, a co-present group or a dispersed group. This issue might be addressed by the way in which the works are framed; literally, whether viewed on a computer, a separated monitor, a wall-mounted screen or projection. There are important questions here of whether the group is required, or permitted, to co-operate *as* a group; whether the experience of the artwork encourages social interaction, such as Agnes

Hegedüs' *Fruit Machine*[40] (which requires the co-operation of three viewers to manipulate objects in 3D virtual space and assemble the piece). Many writers agree that interaction between people is the most significant practical way in which meaning is negotiated and generated, through sharing of ideas, and discussion. (Graham, 1997; Collins, 2000; Gauntlett, 2002) However, there is a need for a model of interaction that will provide for those viewers who attend alone, who seek a sensory, sensual engagement with the work on an intimate and individual level. This study concentrates on the individual experience, but tries to take account of viewers engaging simultaneously.

A related question is whether the viewer's effect upon and contribution to the work is available for other viewers; and whether this effect is a temporary interpretation or performance, or permanent and available for subsequent viewers. Some suggest interactivity should necessarily imply the viewer's ability to change the form of the work both physically and creatively (Jordan, 2000). Against this, Manovich (2001) proposes the Navigable Space as a cultural form in its own right, unique to New Media. In it, the viewer can explore but not necessarily alter the work at a permanent or deep level, or indeed at all. In fact both static installations and paintings can be conceived as navigable spaces to be explored, just as they can be immersive and intimate. They have an almost infinite number of paths, moving between and linking objects, areas, symbols and gestures within the picture plane and linking beyond it to other nearby works, to objects and artworks seen and remembered, to objects and events imagined. Interactive computer-based Navigable Spaces make the visual and locative focus explicit, besides enabling a visualisation of the inadvertant juxtaposition of ideas, of accidental non-choice and the highly creative spaces of liminality and the collision of unrelated ideas or objects. They afford the possibility of uncovering, in a time-controlled manner, new or deeper elements and can be conceptualised as a journey offering physical experiences in space and time. This realisation came, in the later stages of this study, to suggest the possibility of working backwards from the model of an infinitely navigable space - a painting - towards interactivity. The tension between process and product, between interaction as tool and as an engaging experience is a key one. The degree of creative change possible must be balanced against the

[40] installed at ZKM, Karlsruhe

comprehensible form of the piece as a whole and its intentions, and the possibility of 'guerrilla' interaction subverting the work.

The database model, emerging as a dominant one in New Media, reflects the cultural paradigm of sampling. Works such as Sebastian Campion's interactive documentary *Conceptions*[41]allow the viewer to assemble and construct her own narrative from the film segments and their keyword associations. David Rokeby's *Giver of Names* offers an extensible database, allowing new and permanent viewer input in a model related to Fandom's improvisation. Here there is a surface interaction (the viewer selecting objects from a pile in the installation, or bringing them into the gallery herself, and placing them on a pedestal) and a deeper sense of interacting with a virtual space and the database or presumed computer intelligence beyond the interface, in which the computer analyses the objects and produces from them a name - actually a whole sentence. This mirrors the larger overall narrative or meaning of the piece-in-use, and the surface individual story or narrative added by the viewer (Rokeby, 2003).

Permitting viewers to access other viewer's inputs also offers the viewer 'permission' to interpret in her own way whilst also validating her choice.[42] However, while it foregrounds personal interpretation and meaning, it mitigates against an overriding meaning or narrative in the work. Veel (2005) describes a fundamental opposition between narrative and database form, but acknowledges the interaction process as a narrative, through a reflection on the viewer and her perceptions, and a symbolic interpretation of her role and actions. If this conceptual narrative is to be accessed by the viewer, there needs to be some explicit imperative or impulse to reflect upon it.

Viewer Choice and Possibilities

Many taxonomies consider the number and range of actions/ activities with which the viewer can engage, suggesting that more is better. Distinctions are

[41] presented at Manovich's "Soft Cinema" part of a one-day seminar , "Data-based Art" Baltic, Gateshead 18.9.03

[42] this compares with an interpretation approach used (for example)in the Ferens Art Gallery, Hull, where the visitors book paradigm was upgraded to a series of printed wall-panels quoting a number of viewers' varied responses to paintings in the permanent collection as possible interpretations. This now being used at Tate Britain, via their website www.tate.org.uk/britain/writeyourown/

drawn between responsive systems (the computer has all the power), controlled systems (the viewer has all the power); and dialogue (viewer and work have broadly equal power). This is often expressed in terms of amount and significance of choice. The paradigm of choice is somewhat flawed and indicative of a mechanistic or technology-based model of interaction. Peacock (2001) suggests memory and feelings do not work through choice, but rather inadvertent juxtaposition and association. Choice does not address the viewer's perception of the activity in which she is engaged, which might be conceptualised as an actual or simulated activity (such as "watering the flowers"[43]) rather than a navigation, choice or command. In a well-constructed experience, with a high degree of immersion, the former would better model the viewer's perception.

The model of participation (presence, involvement in a spectacle or event) offers high rewards despite being highly proscribed, the participant taking no controlling or choosing role. Rather, the viewer (or her trace) becomes a formal element in the work, such as the mobile-phone owners in Golan Levin's *DialTones* - a musical performance in which participants registered their phone numbers and were given a specific ring tone. This was then used - by being rung - as an "instrument" in the performance. This model has been successfully used by Spencer Tunick's photographic works (in which naked participants form the visual elements) and Antony Gormley's *Domain Field*, (in which plaster casts of the participants bodies provide the basis of 3 dimensional forms) both of which generated positive feelings of intimate, genuine and rewarding involvement in, and shared ownership of, an artwork (Gormley, 2004; interview4, 2006). This in turn led to a deeper understanding of the piece and the possibility of related social interaction. In these examples, the participant's involvement is crucial, intrinsic, and her investment is high. However, the participant engages primarily with the process of creation; she is not the final viewer. Graham's taxonomy distinguishes between artwork with which people can interact during the development, and at the end product stage (Graham, 1997).

[43] this example relates to the piece *Faith*, in which certain click-and-drag actions result in the colour of the flowers on the altar being re-saturated. In feedback one viewer said "I like being able to water the flowers"

An important related question is whether the viewers' actions (and resulting responses) can be informed by causal links or appear random. To exercise choice, the viewer must be able to predict the outcome of her actions. Too much use of random processes will frustrate the viewer's attempts to understand or 'solve' the work. The technology-based model, based on usability and affordance notions from HCI, requires controls that are easy to understand so that rules of behaviour can be generalised. A more dialogic model would include the possibilities of intrigue, surprise, or frustration, and might use these to encourage the viewer to explore the work and experiment until an understanding is reached. A more holistic view would concern itself with the behaviour of the overall artwork and how the viewer comes to understand it through interaction. If the work and its meaning are indivisible, then this implies behaviours being constructed so as to amplify and express meaning; it also suggests the model of a viewer developing a relationship with the work.

Significance

Laurel (1993) examines in particular the significance of the viewer's interaction, the extent to which it affects the work. She uses the term 'robust interactivity' to describe one in which the viewer's choices or actions have a significant effect on the unfolding narrative or chain of events. A useful distinction here might be made between creative interactivity - where the emphasis is on viewers generating new meanings through the addition or alteration of content, and interpretive interactivity, where the emphasis is on viewers engaging with and understanding existing meanings in the work, through a process of personalisation.

Besides the actual amount or significance of viewer effect, the viewer's perception of it is important: how great she perceives her agency to be and for what purpose. This foregrounding of viewer perception is mentioned by McMillan and Downes (2000), who found that respondents reported high degrees of interactivity, involvement and participation in computer-based or -mediated activities, even when actual agency and physical interaction was limited; more so that in a corresponding real-world scenario.

Interaction Mechanisms

The physical nature of the interactivity - gestural or mechanical, visible or invisible - establishes a character for the work and affects the degree of believability, immersion, and sense of participation and of fun. Many large-scale installation systems employ specialist control mechanisms. Early systems used cumbersome 'devices' such as Char Davies' head-mounted display and vest to register breathing and body movements, which enabled navigation in a virtual world, *Osmose*[44]. Later models have moved towards a more natural and gestural system of communicating, a kinaesthetic interactivity, which might be conceptualised as a dance. Simple works such as CrudeOils' reworking of *Folies Bergères* as an interactive video piece (CrudeOils, 2005) use simple presence or undifferentiated movement to trigger visual cues. If a 'customer' approaches the work, the on-screen barmaid will offer her attention. If no responding movement comes from the viewer, she will walk away. Properly kinaesthetic systems recognise and encourage different movements. Simon Penny's *Fugitive* uses bodily movement to control a video landscape, responding subtly to movement dynamics interpreted by the system as 'mood'. (Penny, 2001) Complex systems are responsive and sometimes proactive environments with which the viewer can engage with the work and the other participants in free improvisation. The *TGarden* project (Fo.am, 2005) is a soft landscape playground which viewers (in wearable interface elements) enter. The system interprets and 'translates' the gestural communication of the viewer into specific sound or visual responses, so that the system is perceived as an organism. It is not seen as being controlled, but rather communicated or negotiated with, to develop understanding. Incorporating sound and touch, *TGarden* emphasises the sensual and the corporeal.

The possibility of downscaling gestural, kinaesthetic interactivity to the desktop is interesting. Part of this study is an attempt to find more fluid and less functionalist interaction mechanisms, and a sense of negotiated process rather than command-and-obey. This would involve a holistic approach and a simplification of mechanisms, perhaps tracing and utilising the viewer's hand movements without the need for any 'choosing' action or click.

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[44] www.immersence.com/osmose/index.php

In distinction to the gestural interface, artists such as the Mongrel group - specifically works such as Harwood's *Uncomfortable Proximity* [45] - adopt a more formal aesthetic reminiscent of educational applications. This is a navigable system, which does not attempt to generate an imaginary world, rather a linked set of information. This model privileges content or narrative over form, in a self-reflexive satire on existing systems. The confounding of viewer expectations of the familiar and simple can offer emotional involvement through the juxtaposition of the critique and the critiqued - here, the cultural attitudes towards class and genius reflected in the Tate gallery website.

Open-Ended or Goal-Driven

Taxonomies draw distinctions between interactivity which is free and open-ended, and that which is limited, finite and leading towards a goal or resolution. These distinctions determine the contextual model the viewer will form of the work - as game, task, playground, narrative, experiment or more broadly as an experience. Given the inability of the computer to think and behave as a human, and the practical inability of programmers to program the infinite possibilities, completely free choice is not possible. Interactive narrative champions a model of free engagement but within the confines of a set narrative. This allows expressive interaction, rather than a proscriptive or impositional one but maintains the logical progression and limited interpretations needed for narrative continuity (Meadows, 2003).

Simple responsive systems model the work as a tool, toy or instrument which the viewer performs or plays with - there is no end or goal, although there may be a default position to which the work returns. Münch, Furukawa and Fujihata's *Small Fish*[46] allows viewers to compose and play music, visually, by moving screen objects which are then struck by bouncing balls and moving lines. It is interesting to compare this piece with Jaume Plensa's *Gongs*[47], grand-scale physical objects playable (with beaters) by viewers. Both works offered interaction choices limited by context and by built-in unchangeable elements, and represented performable works which could be engaged with by other

[45] http://www.tate.org.uk/netart/mongrel/home/default.htm. see also Harwood's critique at http://www.mongrel.org.uk/?q=tate
[46] exhibited at the Lovebytes Festival, Sheffield 2002
[47] exhibited at the Baltic, Gateshead 2002

layers of viewer. Plensa's installation is playable by many viewers at once, but contains no mechanism to facilitate or co-ordinate this. It is, however, highly immersive with an enormous sense of presence. The interactivity has a visceral physicality, prompting the question of how such presence might be achieved on a small scale, within the familiarity and absence of tactility of a computer-based work. *Small Fish* by comparison is more playful and approachable, less monumental but actually offers more choice and playability.

Scott Snibbe's *Dynamic Systems Series*[48] resemble toys, with interaction limited to one or two actions in each case, but visually and emotionally satisfying and simple enough to encourage experimentation. In fact these systems have independent behaviour, which is consistent and predictable within its world model; the elements (such as the 'ants' in *Myrmegraph,* which follow 'pheromone' trails laid down by the mouse and respond to the proximity of other 'ants') follow not only the viewer's mouse movements but also their own programmed 'agenda'.

Snibbe's intentions were to offer

> "an instant and intuitive sense of presence and efficacy...(a) sense of touching an immaterial but 'natural' world" (Snibbe, 2006:1).

The playground model extends the toy to an open-ended area for the viewer-as-performer who improvises with other performers or objects. Paul Sermon's telematic works[49] connecting two distant viewers (in blue-screen settings) through one live video output (seated at a table, or lying on a bed) can be regarded as playgrounds, offering free and unguided behaviour with a virtual partner. They offer audiences a space to fill and an opportunity to contemplate how we choose to fill it. In these works, the interacting viewer experiences other interacting viewers as a flat projection into their installation - but for other viewers (of the video screen) both are represented as equally 'lifelike', both occupying the image frame on the same terms.

Computer Games as a specific genre offer a paradigm of goal-driven systems. Handler Miller (2003) offers a useful overview of games classifications according to gross types of engagement - based on skill, reaction time, luck,

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[48] exhibited at ICA, London 2006

[49] Telematic Dreaming, installed at NMPFTV, Bradford and Telematic Vision, installed at ZKM, Karlsruhe

strategy and problem solving. Natkin (2006) offers an overview of Computer Game forms and suggests generic rules. The Game paradigm has been explored as an artform, subverted by artists such as JODI (Dirk Paesmans and Joan Heemskirk)'s *Untitled* modifications of the game Quake. It has been harnessed by Auriea Harvey & Michael Samyn in their game *Endless Forest.* Described as a social screensaver, this uses the mechanisms of online gaming for an artwork which emphasises the visual, and where the notion of a goal is subsumed by the emphasis on social interactions between players, and the temptation to stay and enjoy the world as you pass through it. (Harvey & Samyn, 2005)

Games research examines both the narratological and ludological, concentrating on the emotive, the visceral, and the playability aspect of games. These considerations are important in interactive artworks, but need to be balanced with the visual. Mesch (2006) and Pold (2005) offer overviews of playable artwork based on game forms. Interestingly Natkin's view is that art objects should *not* resemble games, as these are essentially engaging to play but boring to watch, thus excluding the 'outer' layers of viewer or participant in the experience.

Integration

The relationship between the interactivity and the work is important both literally and conceptually. Huhtamo (1995) identified the notion of intrinsic interaction or metainteractivity for works in which the purpose, meaning, narrative and aesthetic are intrinsically connected to the idea of interactivity or communication, thereby questioning, deconstructing or extending it. Extending this idea, one could identify an 'elemental interactivity' which is inseparable from the visual aspects of the work and from its meaning, although its prime focus need not be self-reflexive. Napier suggests that

> "interactivity is effective when it adds meaning to the artwork i.e. a participant gains insight into the work or contributes to the meaning of the work as a result of the interaction" (Napier 2002: no pagination)

Paul (2003), recalling Computing's Structuralist view, expresses a concern that the sensory experience of the interactivity might prevent the viewer seeing the layers of framework and contexts beneath. If interactivity is seen as a way into

the work, the interface and mechanisms become an obstacle, something to be learnt before understanding of the work itself can be achieved. Polaine (2005) suggests rather that the interactivity should *be* the work, not a mechanism for accessing content or meaning beneath a surface. This view might be taken to suggest that a work should not have layers: of detail, meaning, or of emotive power. Rather, this study strives to continue the process of making works with many layers, but to ensure that the viewer's conceptual model is of a single, if complex entity. Polaine's model does suggest an ideal in which the visual form explicitly invites interaction.

Bolter and Gromala (2003) posit the artwork as all interface, but describe this as oscillating between mirror and window - between transparency and reflection. This suggests both an integrated and a simple interactivity, capable of moving the viewer between these two. I have tried to use a model of interactivity which encapsulates the voice of the work. In this holistic approach, the interface and the work are not divisible, although it is possible to focus on active aspects of the work in terms of their accessibility and intuitiveness. However, there are always other layers, meanings to the narrative of the viewer-as-observed-by-other-viewers. This is part of what makes interactive work exciting for us as practitioners, and what enables it to surprise us.

Rather than open-ended playthings, throughout this study I am attempting to create works in which the behaviour of the work is directly connected to its conceptual meaning, in which the idea is elucidated through physical interaction. Kester (2003) identifies a type of work whose meanings are accessed through an ongoing process of performative interaction. Borrowing from Computing terminology, he suggests the term 'dialogical interaction' be reserved for these. The works in this study aim for both this dialogical, and an elemental, interaction.

'Good' Interactivity

An investigation into New Media has revealed a manifesto more than a medium. Whilst interactivity may be an integral concept to New Media, the reverse is not true and useful viewpoints on interactivity can be taken from a fresh examination of other disciplines. My position is to attempt to reconcile the new technology to a tradition of small-scale studio practice, and to an existing

personal concern with both communicative meaning and affective engagement - an emotional involvement for both artist and viewer. It attempts to reconcile this concern with the model of playful interaction, without becoming either didactic or disjointed.

After examining individual definitions of what interactivity should be, my own model of good interactivity strives towards the auto-pedagogic interface - one that would cause learning or communication to occur naturally, as a result of the viewer choosing to sustain an interaction which is pleasurable (Penny, 2001). Recommendations from Learning Technology are useful here, stressing the use of relevant, related interaction and intrinsic feedback; so the process of interacting is in itself pleasurable and 'rewards' can intuitively be perceived as coming directly as a natural result of the activity undertaken (Bork, 2002). Bruner (1961) and Elsom-Cook (1990) describes models of Guided Discovery Learning which entice the viewer-learner into a meaningful engagement; these offer intrinsic motivation (pleasure), understanding and increased retention of that understanding.

Good interactivity would be that which is integral to the visual form and to the meaning, and which is a completely fundamental part of the work. This equates with Iuppa's use of the term 'meaningful interactivity' (Iuppa, 2001). It would be intuitive and easy to use, but explore some novel or surprising way with which it can be engaged. Exploring small-scale screen based works suggests this also must involve intimacy and the possibility of a high degree of immersion. This is supported by Bosma who suggests interactivity that is

> "'intimate' or highly involving, for a small group of people only, creating an unpredictable outcome...(is) interactivity in the purest sense of the word". (Bosma, 2001, no pagination).

4. What is Wrong With This Picture?

Too Much Theory, Not Enough Emotion

> "Art cannot and should not compete with amusement.
> It has business at the heart of humankind"
> (Saul Bellow, quoted in Cooper-Clark 1986:4)

Weibel (2000) has suggested that Art has lost its necessity, and in order not to be marginalised has recast itself as Entertainment. This in turn erodes any role for art,

> "because the professional entertainment industry knows better than art how to make fun entertainment." (Weibel, 2000:4)

This recasting can be seen as part of a general drift towards a play- or game-centred life, and the rise of the concept of Artertainment, or "Art Lite" (Faure Walker, 2006: 293),

Weibel suggests that in order to justify its continued practice and lend it urgency, art relies on theory, as does the modern world generally. This view is echoed by Kuspit's traditionalist observation of a Postmodern Post-Art which relies for its significance on theory rather than any innate quality or significance (Kuspit, 2004). Additionally, Barthes depersonalisation and downgrading of the author to a scriptor who

> "no longer contains within himself passions, humors, sentiments, impressions, but that enormous dictionary, from which he derives a writing which can know no end or halt" (Barthes, 1977: no pagination)

offers a bleak vision of an unemotional, theory-led medium. In spite of this, artists - and writers - continue to feel passion for and in their work, which mirrors my own. Cooper-Clark identifies writer's intense feelings for their work and working progress, from Erica Jong's

> "authentic energy and passion...life, perhaps even vulgarity" (Cooper-Clark, 1986: 115) to Orwell's "horrible, exhausting struggle, like a long bout of some painful illness" (ibid: 8)

This was reflected in interviews conducted by Bomb Magazine (Sussler, 1997), by Kuh (2000) and those conducted for this study (Interview1, 2005; Interview2, 2005; Interview3, 2005). Many described their emotional involvement with the work, the tools and the process.

> "I paint because I love it and can't not do it" (Interview1, 2005)

> "It seems to me madness to get up in the morning and do something other than paint" (Frank Auerbach, in Lampert, 1978: 10)
> "I was completely hysterical and pathetic, but also egomaniacal. Those emotions are like the holy trinity of painting" (Jon Curran[50])

This suggests a polarity between the passionate subjectivity of the individual and the machinic notion of the PostHuman; and increasingly, between the theory and the practice. The object-based art and traditionalist critique is typified by the manifesto of the Stuckists, championing Remodernism as an

> "antidote to the spiritual bankruptcy of Postmodernism. Remodernism stands for content, meaning and communication - subjectivity, emotional engagement, integrity, love, enthusiasm and a spiritual renaissance" (Childish &Thomson, 1999: Handy Hints: 1).

This is echoed by the related Defastenists who suggest "art is a mission demanding complete fanaticism" (Farrelly, Reilly & Moore, 2004: no pagination), a process essentially individualistic, obsessive and fetishistic. The Stuckists originally set themselves against technology, and championed Painting (and later Sculpture) as the only forms of Art capable of expressing and embodying Remoderninst values. Traditionalist critique also stresses the individual as visionary taking a stand against the coldness of science, and the passivity and fatalism of Postmodernity (Kuspit, 2000). Against that, one could set the cool formalities of database art, and the levelheaded facilitation by artists of others' playfulness.

This oversimplified polarity between Modernism and Postmodernism, between new and old media is challenged by New Media artists such as Broeckmann (2005), who champions an art that is urgent, obsessive and passionate and which tries to make a difference to the world rather than decorate or amuse it. Emotional authenticity in Digital Art - as opposed to the artificial, manipulative emotions of games - is also stressed by Blais and Ippolito (2006). Although the Stuckists have declared themselves against the Digital, the existence of Remodernist film and photography groups, and the use of digital technologies by some Stuckist artists suggest the content and emotional veracity is more important than the tools or methodologies. This recalls a Feminist critique of art as emotional truth.

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[50] describing his working process, "Seeing The Light" *Guardian Weekend* 20th May 2006: 36

My ongoing investigation makes it clear that there has been some loss of my own excitement and emotional involvement in the process, during this study. My practice has always been driven by passionate feelings, both positive and negative, and an emotional engagement with the process, the medium, and the ideas. Although ranging across various media, the process was always physical, employing grand physical gestures within an overall field of figuration. This has been part of a larger enthusiasm for life - a rich and participative life full of love, drama and eccentricity. It is in this context that I wished to explore the potential of interactivity to critique the dead and the stultifying, and seduce viewers into an awareness of possibilities.

A number of factors influenced this emotional loss. The bloodless and lengthy process of academic writing, and the reading of works in intractable and intellectual rather than affective language resulted in an excess of theory. The difficulties of locating and viewing interactive art and the frequent disappointment with the experience exacerbated frustrations over the lack of emphasis on the visual. This process had begun to transform a visceral, personal artistic experience into a detached one which received wisdom suggested was an acceptable position.

Utterback describes her working practice in New Media as less direct and connected than painting,

> "it still doesn't feel quite so viscerally connected to me"(Utterback, 2005: no pagination),

but identifies a lessening in that difference

> "The more you do it, the more it becomes like using a paintbrush" (ibid)

The move from the physicality of painting and construction to a new medium involved a change in working method. Although I had anticipated my own model of Painting, informed by an interest in Multimedia, translating into the new medium, it became apparent that what was needed was not a translation, however free, but a new interpretation or reinvention. The early works in this study were particularly program-heavy, and I attempted to apply a Computer Science critique to the code itself - avoiding drag-and-drop behaviour shortcuts and using best programming practice to economise on processor and memory load, rather than a simpler more visually-based approach. This was partly

informed by my location within a Multimedia teaching department, and a desire to improve my technical programming abilities. This presented an exciting challenge, which rapidly became frustrating, then tedious, but finally emerged in triumph. Additionally, the computer offered limited haptic feedback, having replaced the physicality of the process with an emphasis on text (the typing of program code), mathematics (the calculation, rather than the physical construction, of desired effects) and a preplanned, logical working method rather than a visual, organic and dynamic one. The processes of creating images and creating their behaviours were thus separated. The physicality of the monitor and its glass wall placed a barrier between myself and my work, the viewer and the work. Ways needed to be found to disguise or remove this barrier, to work with the medium and not against it, and to retain and amplify the sensuality and affect in this new medium as compensation for the loss of scale and tactility. Struggling with this process prompted questions of whether there is some innate emotionlessness about Computer-based Art, with its detached process, its clean, machine form, and conceptual and physical framing within a monitor. It raised questions of whether the artist and the viewer can have a deep emotional engagement through physical interactivity with this form; and whether the dominant paradigm actually de-emphasises and discourages deep emotional engagement, in favour of the notion of play, of immersion as either playful detachment (Grau, 2003) or as high-speed Zen meditation, beautiful and satisfying in itself (Poole, 2000).

Process

Computer-based works can be re-worked, or created in multiple versions, using the power of the computer to make exact copies. The same program code basis can be overlaid with a completely different set of visual objects, a method easily supported by my chosen software. This permits and encourages experimentation, but could also lead to a lack of commitment in any given work. Berkenwald's interviews with artists suggest that time spent on research that does not result in a successful end product is regarded as time wasted; whereas the re-workability of digitally-produced artworks prevents this wastage of time, materials and money. Her findings suggested correlations between painting as a linear process, digital work as non-linear, spontaneous play offering a more flexible working practice, the ability to 'undo mistakes easily'

(and so take greater risks) and a deferred notion of completion (Berkenwald, 2002). Interestingly, this is at odds with the notion of Art practice as genuine, 'blue-sky' research, the possibility of painting as spontaneous, and undermines the challenge of any risk which can simply be 'undone'.

This reworkability of digital art lends itself to a disposable attitude to the work which mitigates against both finality and climax and therefore weakens emotional investment in the work itself. I have tried to retain a discipline of completing a work, altering it until it works on an artistic level as well as a functional one, but not to make multiple versions; rather to make value judgements and select the best, keeping others only in the spirit of rough sketches and ideas which might be useful later. However, the power of the computer to copy and rework has been useful in allowing me to revisit an old work in the light of further research and replace it with a better, more powerful version, in a manner similar to that of the writers' draft. The realisation that the long-term process of creating and programming an interactive artwork could be compared to that of fiction writing led me to investigate that process, including writers in the discourse and examining writing methodologies.

Disner's summary of advice for constructing narrative fiction could, with minor changes, read as a template for a well-considered interactive artwork. (Disner, 2001: see Appendix 1) The processes and concerns are remarkably similar although the formalities are very different. Interestingly, for the reader of fiction, engagement must be sustained over a long period, and through a sustained process of imaginative 'gap-filling' or constructing interior worlds. This is achieved through effective use of time-based dynamics, and through the human dimension: a high degree of affective identification with one or more believable characters. Fiction therefore offers a powerful model for how to maintain emotional engagement in both the author and the reader.
One screenwriter (interview3, 2005) described a very extended and formalised process of scriptwriting, in which the process was of synaesthetic exploration (looking, listening, feeling, smelling) and of immersion in the story itself until he had formed a relationship with the characters. The final process was to allow the characters to act and simply write down what they did. This mirrors the model of allowing the artwork to develop its own life, through the happy accident

and the unfolding nature of the medium. He described a passionate personal belief in the idea and the story, which sustained the long working process. The writer's passion communicates itself through the work because it is that which makes the characters alive. The reader-viewer responds to them because of the writer's ability to make them real. Importantly, he also describes a love of the process of writing, and of words and their sounds.

Recommendations from Disner and from Bird (1996) describe the centrality of tension between emotional engagement and control - the need to have desire, to be engaged, but also to write calmly and with detachment. Artists also describe the sense of distorted time which enables long periods of working: through a calming absorption and the enjoyment of getting lost in the work (interview2, 2005; interview1, 2005); Morris Graves describes his practice as "a meditation in itself" (Kuh, 2000:116). This movement between the two states is part of what maintains the pace and the artist's ability to maintain a long-term process. Getting lost in the work is more difficult when programming demands an analytical, logical and even mathematical thought process, which interferes with this meditation, forcing attention away from the work and its behaviour into the facilitating mechanisms. This was a particular frustration in working with video, where the editing and post-production process is one of calculating numbers in anticipation of a hoped-for effect, rather than simply physically creating that visual effect. However, as the study progressed it became clear that an emphasis on the visual language would help restore the balance. The emphasis on technology that I had discovered in the theory was being reflected in my practice, placing too much importance on intricate and rich interaction, and too little on a rich and intricate visual. Alongside this, adapting to a new way of working meant learning the concept of sustainable passion from other artists and particularly from the working process of writers; learning patience, and simply by becoming more proficient in programming so that less went wrong. The lengthy process of traditional media is described by some artists as a struggle "to push my limitations beyond their endurance" (David Smith in Kuh, 2000:229). The process of creation forms part of a relationship between the artist and the work, which a change of media does not necessarily alter. Peake characterises this as

> "The love of the painter, standing alone and staring...at the great coloured surface he is making. Standing with him in the room, the rearing canvas stares back...He moves towards his half-born. He is in love" (Peake, 1968:77).

This love affair needs to be kept alive. Catherine Murphy maintains the freshness by working on many works at one time, and although the process is extremely protracted (up to 7 years on a work), she feels that "you have to race to keep up with the painting". (Sussler, 1997:33). Auerbach uses drawing to keep a work alive, trying to start each day with a new vision, something not previously noticed or a new connection (Lampert, Rosenthal & Carlisle, 2001). Works based on computer cannot offer the rich physical surroundings of the studio and the ever-present images of past works. However, where ever-present works might lose their effect, computer-based works must be opened and deliberately examined afresh. This revitalises the old works, causing the artist to see them anew. I found this formed an important part of the process, and the possibility of playing with old works - already completed and debugged - was an important part of this revitalisation and pleasure.

Whilst unfashionably romantic, this love-affair metaphor encapsulates the passion and perseverance of the true *amateur*, the participant. It is not medium, so much as questions of authorial voice and dispersal which weaken the relationship. The Stuckists' original manifesto describes van Gogh as an archetype of the artist

"whose work was fuelled by an intense love and philosophy, a burning desire to contribute through the expression of his vision for the benefit of humanity". (Childish & Thomson, 1999:5)

This powerful and impassioned model of the artist has been deprecated along with outmoded notions of elitism and genius. Against the emotion and intensity of the individually authored work, Whitman considers collaboration as a compromise; he is

"still waiting to see God in an interactive work" (Whitman, 2000).

Collaborations necessarily contain multiple viewpoints and emotions; clearly, however, they also offer the possibility of consensus or shared emotional response as a very powerful force. The question of whether, and how, emotional strength derives from collaborations is too wide for this study,

centring as it does on an individual practice. However, Gaver's[51] model - of the idiosyncratic, subjective and personalised voice as a force for inspiration and a sense of wonder in the viewer - suggests the need for an individual personality behind the work. This can be compared to the fandom model of engagement of fans based on their view of authors as

"enthusiasts who believed passionately in their work, and the energy of their beliefs" (Patrick McGoohan, quoted in Lewis & Stempel, 1993, introduction).

The fan's trust in the author, in the viability or coherence of his beliefs, and in his supposed intention, representing an enigma to be solved, are all identified by Lewis and Stempel as important factors.

Medium

Conceptually, the possibility of endless mutation and reproducibility weakens the artwork's authority and aura, which affects both artist and viewer. Lovejoy (2004) describes this loss of aura as the loss of evidence of the human connection. She cites Laurie Anderson's claim that technology has brought great social and cultural gain but a great spiritual and social loss. Virilio characterises contemporary art and the technology that produces it as emotionless, and dehumanised, increasingly filled with noise and image, but not correspondingly with meaning. He claims

> "art has abandoned its passion and sexual force" (Virilio, 2003:21),

Stafford's suggestion that Art should reflect life; not as the fantasy of a seamless whole but the reality of a database of juxtaposed and separate units (Stafford 2005) is a cold model- it does not deal well with the notion of an emotionally and visually holistic experience. Lunenfeld (2001) suggests this separation limits viewer thought, dissecting ideas, metaphors and images into unrewarding 'nano-thoughts'. The nature of the digital is, for Baudrillard (1983), cold. He opposes it to the hot universe - Art - filled with investment, desire, passion, seduction, and expression. His model suggests the digital as superficiality offering intensity without depth; fascination without engagement and communication without meaning. Wallinger (2000) characterises the Digital as lacking authenticity, authority and believability through its lack of passion, replacing genuine affect with nominal triggers for sentiment; and meaning with

[51] see page 34

gesture. However, importantly, both he and Virilio suggest this is not an inescapable condition of the medium, but of the ways in which it encapsulates Postmodern theory. This suggests digitality, and the contextualising of interactive work in the philosophical realm of the digital, is what weakens its expressive and affective potential.

The expressive, and affective, can be tied to the human connection which is not only conceptual but also visible. David Hockney describes the freshness and power of images created through human gesture; through the human interpretation offered by Painting. This he compares with the dullness and homogeneity of the photographic and machinic. He mourns the single dominant way of looking he discerns in screen-based images, observing

> "No wonder people are bored - they can't see how rich [the world] is, how beautiful it is" (Marr, 2003: no pagination).

He posits the painting as more like reality than is a photograph, investing the real with emotional significance, with a nearness and richness that can affect the way reality itself is subsequently viewed. The working processes of the computer privilege the mathematically derived - smooth and regular, rule governed movement; clean and independent form - over the organic and holistic, reinforcing the photographic, filmic and collaged aesthetics. The dominance of the photographic and filmic forms in interactive media diminishes the expressive, replacing an interpretation or embodiment of affect with its depiction. These representations or depictions can be powerful: Krappala's investigation of the photographic works of Jyrki Parantainen - images of blazing buildings - found viewers identified symbols of power, rage, passion and purification. She identifies in them a tension between love, beauty and fear (Krappala 1999).

Overall, the use of cut-and-paste collaged, sampled imagery reinforces a visual staccato, an aesthetic of edges and separation rather than gesture, and development. Jarvis (2004) compares the aesthetics of Digital Art (that is, non-interactive images intended for print) to those which characterise Pop Art. In wider sensory or sensual terms, the screen seems to place a flattening barrier between the work and the viewer, which eliminates actual texture, smell, and the sense of presence and intimacy that an object-based work can offer. The

ubiquitous monitor, the fixed aspect ratio and the glass wall represent dehumanising and limiting factors. The philosophical notion of embodiment discussed by Hansen (2004) and Jäger (2005), set the physical involvement and movement of the viewer as an affective balance to this dehumanisation. This suggests a re-negotiation of the relationship between the body and the work; but how successfully can this be achieved on a small scale of interaction, through movements of hand, arm and eye?

More conceptual associations may affect the viewer (and the artist). The computer introduces an abstraction, or separation between input and output - while it retains a strict and logical internal structure, it can map any input onto any output in an apparently arbitrary connection. This is suggestive of dispassionateness. Torres (2000) suggests that viewers equate technology with multinational companies, death and ecological crime; Art, by contrast, they associate with the human spirit. Taylor (2005) describes the condemnation of early computer arts as cold, soulless, dull, lifeless and aesthetically inept. This prejudice, which persists amongst many old media theorists, Auboiron (2004) suggests is still very widespread.

Computing is beginning to acknowledge the value of affective interaction, as evidenced by conferences such as Passionate Machines[52]. Research into emotion in Computing mostly centres on the notion of capturing the viewer's emotional state and developing systems which will to adapt to this and simulate believable emotions. Humaine[53] - the Human Machine Interaction Network on Emotion - is an important player here.

The Postmodern emphasis on play is in tension with the emotive. Grosberg's model of Fandom places passion or obsession - which leads to empowerment - in opposition to pleasure which can be disempowering and passive (Grosberg, 1992). It suggests play as engagement without commitment or passionate involvement. Play can be seen as ironic and detached as opposed to involved and affective (Disner, 2001), and concerned with surface rather than depth, passion or meaning (Faure Walker, 2006). The Toy or Game model of artwork

[52] 2003, proceedings archived at www.carte.org.uk
[53] Humaine, set up in 2004, proceedings of their seminars and conferences can be accessed via www.emotion-research.net

seems limited - a 'fridge magnet poetry'[54] approach, which offers little added-value, so that the viewer-player-poet gets out of the experience only in relation to what she puts in. This suggests the artist need add nothing - no impetus, seduction or guidance- to the toybox.

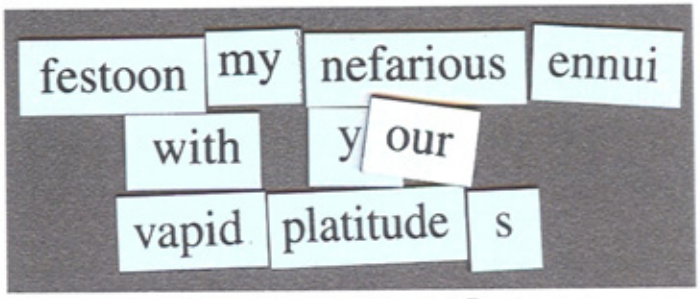

Figure 7: Fridge Magnet Poetry

There is a tension also between spectacle - the sensory overload of sound and vision, and the notion of something simple, suggestive; engaging the emotions more than the senses. Lister et al (2003) suggest that computer-based works can best offer sensuous experience and affect internally, through a minimal single-channel experience, such as the model of fiction writing and the gaps left by text for the viewer-reader to fill. This creates a space for imaginative participation, and suggests work which is abstracted, drawn or painted and used to support the viewer's internal mental constructs rather than a more common technological model of the complex and highly rendered virtual world. It suggests a work viewed as a whole, single entity.

The widespread lack, in critical writing, of emphasis on the visual, compared to the technological or the interactive both points and contributes to the waning of a level of possible richness and affect. Baudrillard identifies a key shift when he complains that

> "Everybody will become an interactive creator and this is probably democratic. Maybe this is human and political progress, but it's certainly not...aesthetic progress." (Baudrillard, 2001:3)

However, Hansen's suggestion that New Media goes beyond the visual to embodiment, describes a

> "shift in aesthetic experience from a model dominated by the perception of a self-sufficient object to one focused on the intensities of embodied affectivity" (Hansen 2004: 12-13)

[54] Fridge magnet poetry was created by Dave Kapell, 1993. I have since discovered an online collaborative fridge magnet poetry, André Clements' NetVerse at http://netverse.andresc.net/

He suggests that interaction with the complex topologies of digital space - and time - necessitates a shift from visual to haptic space. This suggests that the emotional engagement comes from the interaction itself. The works in this study can be seen to inhabit a space which, while not cinematic in Manovich's sense, refers strongly to the picture plane. This space can become haptic through interaction and the ability of the work's behaviour to suggest a deeper world beyond this plane. The images are self-sufficient, but do not stand alone, disconnected. They contain references to other images, ideas, emotions and behaviours as paintings do. During the course of the practice I became disaffected by theory's lack of emphasis on the visual, and my own practical acceptance of it, and began to ask a fundamental question about the contextualising of interactive art:

"Why Can't Interactive Art Be More Like Painting?"

This question was presented to a seminar of Fine Art MA students, and prompted a reply that suggested I should simply return to Painting. At this point, the question ceased to be rhetorical and I began searching for ways in which interactive art could, in fact, be more like Painting. I began to seek commonalities and tensions between a screen-based and a painted aesthetic and question whether there was indeed any reason why these practices need be separate.

This realisation began a shift from interactivity as a starting point to the consideration of the medium itself and its potentials, both visual and affective. It suggested going back to basics, with the benefit of a significant knowledge of the body of work in existence and the technologies which support it. This was the inevitable journey from focussing on the technology and the theory, to focussing on the art, reflecting a journey of maturation both of the artist and the genre itself.

New Media Context and Schisms

Morse has identified a schism in New Media's attitude to Interactivity, through a discourse that is

> "ideologically loaded, even schizophrenic in its tension between pejorative connotations and utopian values and expectations." (Morse, 2003:17)

This schism underscores the tensions between surface and depth, process and product; and conflicts between the seduction and the manipulation the viewer, the technologically complex and the affectively rich, the machinic and the human. It uncovers confusions between notions of the viewer as metaphorical and as literal author. In the hyperbole of critical writing the viewer's authorship - or rather improvisation - of the narrative of her experience, is conflated with notions of authorship of the work. This distorts the true nature(s) of the interactivity.

For example, Camille Utterback and Romy Achituv's *Text Rain* is described by Bolter and Gromala as a creative experience offering freedom of action for the viewers. The piece contains a text in which individual words fall down the screen until stopped by contact with the viewer's projected shadow. This permits certain combinations of words to be temporarily constructed, which

> "sometimes... make just enough sense to encourage the viewers to find meaning" (Bolter & Gromala, 2003:13)

They describe the work as

> "a text they (the viewers) write in the process of reading"(ibid).

However, the text they refer to is neither the fixed text content of the piece, nor the 'text' of the work overall, but the narrative of the viewer experience of the work. I observed viewers interact with this piece at the Hospital Festival (Utterback, 2002), and viewers of a formally similar work *Bubbles* (Münch & Furukawa, 2002) - in which the viewer's shadow can move, bounce or burst on-screen bubbles - at the Lovebytes Festival. In both cases the viewers interacted with the work individually, in a contemplative, investigatory manner, or as a dance. They also acted in groups, with much laughter, conversation and co-operation, linking arms to form a sentence or collaborating to herd the bubbles into a shape. Some viewers adopted a more confrontational and destructive approach, breaking up phrases or bursting as many bubbles as possible. Viewers were heard reading the text content aloud, and attempting to 'collect' the complete text. The overriding impression was of interaction with playful, seductive objects offering a tension between creation and destruction, co-operation and competition. However, the text-of-the-narrative-of-the-viewer-experience becomes, for other viewers or theorists, a naked exposure of human

behaviour which, the more immersive the piece, the less consciously or willingly the viewer consents to reveal. In this sense, we can appreciate Daniels' complaint that participation often

> "makes of the viewer a guinea pig rather than a creative co-player" (Daniels, 2002:21).

The reproducible and mutable nature of Digital Media is taken as both mechanism for, and proof of, the end of the art object as unique and high-status. Traditional art media (along with notions of draughtsmanship, apprenticeship or craft skill) have been superceded by accessible techniques, and the aesthetics of sampling and bricolage. Meaning has become de-emphasised and the internet opens up the means of production, and exhibition, to everyone. This leaves theory (if not practice) with a confused and minimal distinction between the concepts of art and creativity. Joseph Beuys, for one, famously championed the active mobilization of every individual's creativity as an energy for social change. This is reflected by writers such as Cubitt (1998), who champions the spontaneous creativity of amateurism and the authentic voice of the participant. Beuys' vision of 'Social Sculpture' - a co-operative cross-disciplinary effort directed at re-shaping the fundamentals of life - describes a hive-mind of the community (Tisdall, 1979). However, it did not preclude the artist continuing an individual studio practice. New Media's redefinition of Art as process does not fit well with such a practice - but, more importantly has not supplanted it, and it continues to thrive in Universities and studios. The announcement of the death of the author is, like that of Mark Twain, an exaggeration.

Postmodern digitality is seen as signalling the end of the artist as autonomous and differentiated, as expert or genius. Lunenfeld (2001) claims genius has been replaced by irony - and in playing there are no experts. However, writers and artists who champion the democratic, rhizomatic, dispersed author, simultaneously acknowledge the ideas and practice of 'experts' such as JODI, Vuk Cosic and Harwood. This duality is aptly demonstrated in Mèredieu's popular overview (Mèredieu, 2005), and referenced in Hopkins' observation that

> "Deconstruction of authorial presence did not lead to artists deconstructing their own authority" (Hopkins, 2000:212)

Intellectually, we may appreciate the power of the dispersed author but, it seems, emotionally we are unable to drag ourselves away from our individual practice as artists or theorists. Viewers also may have highly personalised interpretations of works, based on how they mesh with their personal experience and philosophy. Solfrank's (2003) suggestion that meaning is invented as an agreement between viewers is problematic; it does not encourage (or necessarily permit) eccentric or individualistic readings. Albert points out that democratic artworks do not necessarily empower the viewer's voice to be heard, but rather swamp it in data debris (Albert, 1998). This is to relegate the notion of a viewer's personal creative interpretation to a limited choice informed by the weight of majority, and to dilute the power of the perverse and individualistic in the viewer as much as in the artist.

New Media transmutes the artist, theoretically, into a designer. Bolter and Gromala (2003) suggest that artists working with interactivity should regard this practice as radical experimentation in Interface Design. However, while the logical extension of Postmodern viewer-as-author suggests

> "you (the artist) can't predict how people (viewers) will interpret things"[55],

Design assumes that you can - within a limited range of possibilities - and more importantly, should. Whilst the issue is debated amongst practitioners on, for example, NeTTime and the-cyber-kitchen, conferences such as Engage06 have begun to emphasise the centrality of audience, to foreground viewer affect and experience, and champion the adoption of models from User-centred and Experience Design.

This recasting of the role of artist is reflected in the location of New Media and Interactivity as disciplines within learning institutions; variously sited within Design, Media, Film and Animation, generic Fine Art, Computing/Technology, and the new specialisms of Digital Media and Digital Fine Art.[56] The diffusion of the identity of the artist has led to a diffusion of that personal, idiosyncratic and emotionally authentic voice within artworks. This diffusion suggests a weakening of the artistic impulse, both a creative and an emotional impoverishment. An overriding question becomes whether, if artworks critique,

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[55] Paul Butler speaking about Butler brothers' work "Genitron", at Lovebytes, Sheffield 2002
[56] see for example the UCAS listings http://www.ucas.ac.uk/search/index07.html

subvert or distance themselves from the dominant aesthetic and philosophy of digitality, this will distance them from the viewer's world view; whether they will still invite engagement.

Meaning and Meaninglessness

> "Some pictures tell a story
> others are just mysterious
> it all fits together
> slots in like a puzzle
> It is so annoying
> when you don't know what it means"[57]

The de-emphasis of narrative, the splitting of form and content in the Postmodern in general and New Media in particular is problematic. Much theory explores whether Art in general can or should mean anything; if so, what is the conceptual nature of the meaning and the abstract process by which the work holds meaning. It investigates this rather than the process by which meaning is understood by the viewer, an area left to be colonised by Education. Benett offers a representative view of her own practice:

> "You (the viewer) can get meaning out of something if you want to; it's not really up to me to say what something's about" [58]

This is in opposition to a long tradition of art as communicating stories, ideas and impulses to social and political change encompassing the murals of Diego Rivera, the reworkings of Yinka Shonibare and the paintings of Paula Rego: more importantly, it discounts the evidence of viewers seeking meaning. Whilst Barry (1996) suggests that audiences engage with interactive artworks in order to enjoy and play, *not* in order to access content, studies of the viewers suggest meaning is important. Lakoff and Johnson (1980) suggest that causation remains a basic human concept; we seek to explain the reasons for events and occurrences and if necessary will anthropomorphise events or chance factors in order to provide causality. Kerby (1991) describes narrative as a fundamental way of understanding individual and collective human experience and selves, which cannot easily be expressed or understood in other ways. Published

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[57] Participant's Statement (M.Blackburn) included as part of wall text at the exhibition *"Connect4"* Impressions Gallery/ York Art Gallery May-July 2004.

[58] Peoplelikeus (Vicki Benett), 2002 presenting her video work at the Lovebytes Festival, Sheffield, April 2002

reviews offer ample evidence that viewers do still seek an intended meaning and will seek help from available interpretive materials.

> "Reading the catalogue text after seeing White's work was a bit of a blow - I didn't pick up on most of the references and meanings that were intimated. Whilst I found the pieces quite interesting, the catalogue text put a whole new spin on them." (Howarth, 2002 no pagination)

This suggests a viewer prepared to explore in order to satisfy curiosity, not merely for exploration's sake. This desire for meaning is supported by research in Visitor Studies, which suggest that most viewers do read labels and wall texts, even as galleries are moving towards more comprehensive labelling and explanations (RCMG 2001). Elkins (1999) found that viewers seek a narrative organisation and will tend to impose one if it is not given, as part of a search to make sense of the world and their own histories within it – and from a fear of the unfamiliarity of the image. This suggests that an image which is too accessible might be accepted at face value and without the imperative to explore or engage on deeper levels. Recent research also found that gallery visitors typically looked for and discussed three main areas in visual artworks - the process, the visual and formal qualities, and the socio-cultural context. Within this,

> "Subject-matter was identified, described, turned into a story, or scrutinised for meaning or message; the artist and his/her intentions was discussed; associations with places, personal experiences, people, other exhibits were made" (RCMG, 2001:5)

The study noted that visitors criticized artists for their (perceived) lack of effort to communicate with their audience; that effort was equated with showing respect for the audience. Visitors were found to be prepared to make an effort themselves, in order to understand what they saw. This is an important discovery, indicating some mismatch between theory and viewer practice, and suggesting that viewers need to know whether there is any intended meaning for them, and then to have 'permission' to interpret that meaning in their own terms.

Viewers like to see themselves in the works - literally, via a video feed or shadow projection, or by making their own marks and visible additions to the work; and metaphorically to see themselves reflected in it. This echoes

observations from Vogler on what informs successful and enduring narrative fiction writing; stories which

"can be felt by everyone because they well up from a universal source in the shared unconscious and reflect universal concerns". (Vogler, 1998:11).

Viewers often seek to personalise what they see, by relating it to their own lives and experiences, to establish an affective connection. Krappala found that viewers in her study created links between the work and their lives, so that

> "talk about the work turned out to be talk about oneself; the death of a mother, a lover that was gone, having one's first grandchild" (Krappala, 1999:107)

Significantly, these are all moments or memories of high emotion. Krappala's viewers mentioned corporeal, physical, and even sexual responses to the images. Strong emotion clearly offers a way for viewers to enter a work, where meaning may be neither dialectic nor didactic but more an affective or sensuous understanding.

Housen & Yenawine (2004) made detailed research of viewers, and identified five stages of development of viewers' aesthetic thought. Most viewers were found to operate at stage one, concentrating on the observation of emotion found in action, gesture or expression; the construction of narrative; and the relating of work to personal experience. Some operated at stage two, making critical analyses of the artist's intention, of context, symbolism, technique and media. Their findings also suggest the importance of focus and reflection.

Baber et al (2001) found viewers' engagement with work dependent upon 'visual appeal' and familiarity, but also curiosity. This suggests a primary interest in the visual, in the 'beautiful'. It indicates a tension between the desire to enjoy something known - the familiarity of the self, reflected - and to experience new ideas, or stories. With the increasing ubiquity of the screen-interface paradigm, viewers may require something - which could be behavioural - to perturb the viewer's sense of (over) familiarity.

Interaction and Meaning

The extensible database model, where viewer input permanently changes or adds to the form of the work, submerges any intended intrinsic meaning under viewer reading-and-writings. Similarly a large and complex hyper-system, which

can be viewed only in fragments, mitigates against a coherent narrative or meaning. But is there any sense in which a more limited, viewer-work interaction disrupts communication?

Several writers agree that interactivity can break the narrative flow and prevent the development of a dramaturgy, destroying the sense of dramatic possibility and pace. (Laurel, 1993; Meadows, 2003; Iuppa, 2001). Cameron (2002) further argues that interactivity and narrative are fundamentally opposed; that when interaction is introduced, the narrative becomes a game and therefore something frivolous and without significance. Thus when interactivity allows the viewer free will to act, it is inevitably at the expense of narrative coherence. In addition, the use of rapid, game-play style interaction disrupts communication by preventing distance or reflection. Leemkuil (2003) found that gameplayers, immersed in the play, were not consciously aware of the concepts they were encountering, nor able to transfer them to another context. Their thinking during the game was unselective and non-effortful. Poole describes immersion - abandonment of the body and the context of actual time and space - being broken by the necessity to make a decision (Poole 2000). This action forces the viewer back into her own body, into the haptic dimension.

This suggests a model of slow-paced interaction, without the imperative of a specific goal; one in which the viewer's perception is not of decision-making but of a natural exploration - not 'which path should I select' but more simply 'where shall I go'. Poole's model here is of "a sophisticated illusion without responsibility" (ibid: 123). The New Media, Postmodern foregrounding of play and immediacy tends to mitigate against the contemplative. Hammel (2002) characterises interactive artworks as sites for continuous tactile exploration, action and interpretation but not – in contrast to traditional art media - for deep thought. This suggests concentration on action and surface, a work without any voice beyond the calling of its own name, what Faure Walker (2006) refers to as 'dumbed-down art'.

TV has fostered the cultural phenomenon of 'zapping', an attention-deficit-disorder aesthetic of fragmentation, chance and disjoint which echoes the computer's power of visual and aural sampling, and random re-appropriation.

This, according to de Gaetano (1998), encourages scanning and rapid orientation but discourages the development of concentration. Lovejoy (2004) also suggests TV trains viewers to look indirectly, even subliminally, and not make deep associations. This, along with development in both Interactive and Reality TV, has encouraged the emergence of an Interactive Audience; one which has been shaped by the current cultural context to expect and demand interactivity and participation. All of this suggests that screen-based interactives may be seen within a context of rapid, playful and surface engagement, demanding rapid feedback. However, Audience Studies tends to centre on Games, TV and Film rather than Art, and to retain a view of active and passive publics - of a critically engaged audience and 'the masses', as defined by their access to the cultural resources or language (Blackman & Walkerdine, 2001). Investigations of Gallery visitors tend to conflate Museums with Art Galleries, and necessarily consider mainstream galleries with permanent collections, rather than those dedicated to contemporary, artist-run, temporary shows. This tends to collect views of the Gallery as elitist and educational; as archives of culture and memory, rather than living contributory experiences, places for exposure to the new, the challenging, and exciting (MORI, 1999). This is currently being addressed by research specifically into audiences of interactive art[59].

In the highly theorised area of New Media, the artist and the theorist are not necessarily agreed on interpretation, even of the artist's own work. This is not new, but is in part a curatorial problem, arguing for greater artist control of interpretation. It also represents a problem for the viewer, knowing how she should, or how she wishes to, regard the work. The viewer's understanding - both intellectually and emotionally - is dependent on context, which filters the work. The contemporary cultural context and its history are important filters, but for most viewers this is unlikely to include detailed understandings of contemporary critical theories - rather a general notion of the digital condition, and popular culture. As artists seeking to communicate we have a remit to make the work, and an understanding of it, more accessible and less intimidating. The shift towards validating and encouraging personal response has been accompanied by a shift towards viewing the Art Gallery as not a

[59] see page 16

cultural temple, but a place for developing skills, knowledge, attitudes and perceptions (Hooper Greenhill, 2002).

The identification of the object as Art - framed by the cultural context of the gallery or public display space - and the creator as Artist imbues it with a particular voice. Putting a frame around the world in the shape of a screen creates a window which both edits, and focuses upon it, pointing out its significance and changing our perception of it (Manovich, 2001). This editing is more effective if the work has an interactive dimension – a highly edited and simplified model of the world's behaviour. The viewer's ideas about the artist's identity and her implicit continued presence in the work are made more explicit by the interactive dimension - a communication representing the artist's voice. Many consider this presence manipulative, preventing the viewer from having any real power (Biggs, 2003; Shulgin, 1996; Daniels, 2002). However, I take Huhtamo's view, from an earlier, more interaction-focused and less New-Media-specific position, seeing this as a positive element in an expanded and ongoing dialogue

"with multiple 'partners'...: the physical 'frame' of the work, the fictional world it 'contains' with all its elements, the software with its agents, the implied author(s) of the work". (Huhtamo, 1995:4)

Interactive installations are often seen outside the gallery: at conferences, festivals or screenings (such as Ars Electronica, SIGGRAPH, Lovebytes), or in dedicated museums). This tends to emphasise the difference between Digital and 'other' Art, even that which includes digital processes in its creation. In addition, many smaller galleries and artist-run spaces have a lack of equipment or budget to hire it, and are ill-equipped for the Health and Safety implications of interactivity. Open submission shows often will not accept it. The computing and art contexts - Manovich's Turing-land and Duchamp-land (Manovich, 1996) - place two distinctly different sets of priorities upon the work. ZKM Karlsruhe was set up partly to address the gap between the two, and prevent New Media from absorption into either camp (Schwarz, 1997).

Within the gallery context, curation and interpretation add filters which

> "spoil the pleasure of the fresh encounter" (Faure Walker, 2006:172)

offering an intellectual response which may anticipate, and thereby weaken, any emotional one. In a theory-heavy medium, the depth or abstraction of critical theory's interpretation often requires re-interpreting for the viewer; Lazar (2000) has suggested that viewers of New Media appreciate the ability to find out about the work without the guidance of additional curatorial intervention. In this context creating relevant and meaningful communicative work that can be taken seriously is a challenge.

Many writers agree that interaction between people is the most significant practical way in which meaning in a work is negotiated and generated, through sharing of ideas, and discussion. (Graham, 1997; Collins, 2000; Gauntlett, 2002) The experience and emotive affect of the work may be amplified through sharing. However, Graham discovered viewers do not necessarily engage in collaboration even when it is expressly invited.

> "the degree to which people *want* to collaborate is perhaps overestimated" (Graham, 1997:121)

This is an important observation. In fact interacting with a work (cognitively or physically) as an individual and in a group are two very different experiences and both have an important role. There is a need for a model of interaction that will provide for those viewers who attend alone, and who seek an engagement with the work on an intimate level. This experience may be triangulated, between the viewer, the work and the other viewers. However, interaction with and observation of other viewers, and their performance of the work is difficult to predict. It may be perturbed by 'inappropriate' audience responses - those that do not match with the viewer's own. Alternately, the experience may be triangulated between the viewer, the work and the interaction itself representing a third voice. This idea of triangulating relates to Learning Technology's suggestion of the function of verbalising - making explicit and reflecting upon ideas as part of learning, by creating a space.

Douchet (1993) describes this as an intimate and personal reception, followed by a more collective organisation of responses; re-telling and re-casting impressions. Often achieved through conversation with other viewers, such a re-casting might also be provided by physical action. Interaction might be used to introduce a delay of space and distance.

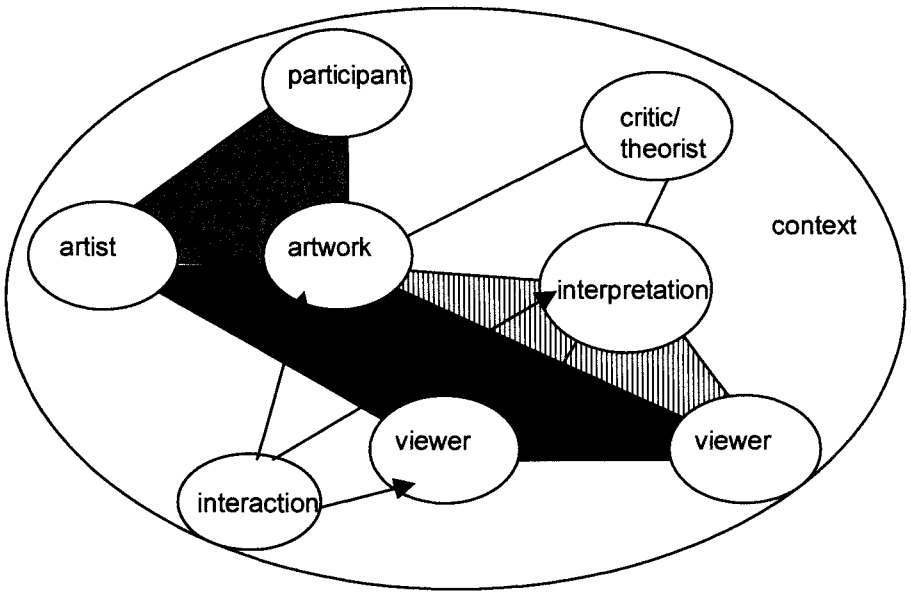

Figure 8: Triangulating Interpretation

Lecercle (1991) describes this process as constructing an intermediary stage between the idea and the meaning, delaying the recognition to allow the subconscious to gather a collection of relevant memories and generalise a rule. This idea is supported by other findings from Learning Technology; that interactive exhibits in a museum have significant impact on an audience's understanding and long-term memory (Stevenson, 1991), and that retention and some kinds of learning are facilitated by interactivity (Schwier & Misanchuk, 1994).

The Problem of the Interactive Viewer

Some interactive works may rely for their meaning and power on the viewer 'using them properly'. George Legrady's *Pockets Full of Memories* is a database of objects and their descriptions added by viewers; the work sorts the images of objects according to links derived from the descriptions. (Legrady, 2004) The sense and power of the work are affected by the degree to which viewers make personally meaningful or thoughtful choices about which objects to include and how to describe them. This is problematic in a context where, as Graham puts it

> "the quality of these artworks depends not only on the artist, but on the quality of the audience response, and on the quality of the context ... for the audience to participate effectively" (Graham, 2001, no pagination)

or, more baldly put by Paterson, discussing online interactive work PDPal

"People put in a lot of gibberish" (Paterson, 2003 no pagination).

This problem relates to observations that audiences of interactivity seem stuck at a level of slapstick and destruction (Rieser, 2002; Hales, 2002). There is always a danger of interactive works attracting throwaway input - insincere, unreflective or deliberately disruptive; the random and guerrilla response. This is encouraged by swift (uncommitted) and anonymous input in an unmediated arena. Visitors will test a system, and challenge it in ways they would not with static installations. Meadows (2003) suggests that audiences will always attempt to derail a scripted interaction - indeed, this is to be expected where the artist offers a creative space but proscribes limits which may seem arbitrary.

I have observed visitors using Sermon's *Telematic Vision* and *Telematic Dreaming*[60] - where groups of boys used the facility of telepresence to virtually attack and punch other groups of people at the linked location. According to Grau (2003), the artist's intention in these works was to permit users to explore, experience and critique the established boundaries of social intercourse. The actions of these viewers transgressed those boundaries but did not appear to explore or critique them. However, it may have prompted other viewers - myself included - to do so.

Stocker and Schopf suggested that viewers are shy of interactive works - hampered by the 'Do Not Touch' gallery culture, embarrassed or disturbed by the possibility of surveillance, and frustrated by the appearance of being forced to behave or engage in a pre-determined way. (Stocker and Schopf 2001) Works need to permit the viewer to build a mental model of the virtual or conceptual space occupied by the work, and the rules which operate there. Anstey (1998) observed that complex interactions were hard for (even an informed) user to see, understand and control. This highlights the importance of context and the viewer's expectation; and of giving the viewer a clear indication of how she should regard the work and behave with it, through the immediate environment and feedback. Heath & vom Lehn's research suggests that viewers have highly individualised and personal ways of wanting to engage with works (2002). Interactive art is not different from other artworks in this, although it does offer an additional layer of engagement.

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[60] see page 46

5. Early Work and Interaction Models

The search for answers to these problems has been conducted through the practice, in a parallel process to the other forms of research. As the practice identified more questions, and more opportunities the research focus shifted to accommodate this.

Making Interaction Work

> "The interactive is as powerful a way of conveying meaning as the visual and the sonic...and in its texture and forms is richly connotative and metaphorical"
> (Peacock, 2001 no pagination)

Interactivity is a part of the work's aesthetic and is therefore available as part of the language to add intellectual or emotional meaning and pleasure. It offers more levels of richness and more opportunities for the exploration of understanding. Even a simple responsive interactivity alters the dynamics of the experience and the role of the viewer. A formal, contemplative gallery setting may become noisy, playful and informal. A large crowded gallery may become an enclosed and intimate immersive world. Shedroff (2001) suggests that since humans have an innate creativity, permitting them even limited opportunities to create, customise, and participate makes them feel more valued as humans. This endows the experience with more meaning and value.

My own interest in interactive art is to explore ways in which interactivity can draw the viewer in to the work and enable communication, understanding and emotional engagement. This contains a key tension between making the work accessible and retaining some suggestion of power and magic. In the body of works that make up this study, the interactivity is integral, an elemental interactivity, and therefore observations about how it 'adds value' are difficult. However, some key avenues have been explored and some recommendations tested which contribute to the viewer's accessing of meanings and emotional involvement.

Making the Conceptual Concrete

An Educational model of interactivity identifies learning as drawn out through a process; initial experiences, reflected on and evaluated, are conceptualised into

a theory. This is then tested, re-examining existing understanding and concepts in its light. This can be viewed as an expansion of the cognitive interaction model, but with the Constructivist notion of Active Learning, through personal discovery and the explicit, concrete testing of theories. This then suggests physical interactivity being used to expand cognitive interactivity.

Standard interpretive texts often describe artworks as 'calling for' or 'inviting' a particular questioning by the viewer. Contemporary criticism likewise describes works as 'challenging' the viewer's beliefs, or 'confronting' assumptions - but this call is not explicit and may be overlooked. A time-based medium opens the possibility of a literal confrontation or challenge, confounding the viewer's expectation of cause and effect. Interactivity further offers the possibility for the viewer to formulate and test theories of cause and effect - or assumption and actuality, as well as making explicit and literal the process of seeking.

Interactivity can be used to make visible other associations and facilitate the unfolding of the narrative springing from those links, offering a support for the mental process and promoting effective thought. The tracking of viewer eye movements is used in Joachim Sauter/ Dirk Lüsebrink's *Zerseher*[61] to record and inscribe the trace of the gaze onto the work - a digital copy of Francesco Carotto's *Boy with a child-drawing in his hand.* This acts perversely by disturbing pixels in the area of the gaze, ultimately to destroy the image, in a complex and reflexive allusion to the nature of perception and image. Similarly, in Tiffany Holmes *Nosce Te Ipsum,* the work tracks the viewer's footsteps as they approach the image (of an outline figure) as the viewer treads on (pressure pads beneath) words such as "slice", the image is dissected to reveal layers beneath, showing more detail, increasing numbers of bodies, and finally an image of the viewer herself as the innermost layer of the image.
In such works, the viewer becomes engaged in a metacognitive process, of explicitly seeing her thoughts translated into action and image. These works describe a single, simple idea that can be unfolded through the interactivity. I have explored this model simply in *What?*, which draws a map of the viewer's choices over time and reveals the distance travelled from one concept to another. In *Passion* the viewer's gaze over time reveals other - literal - layers of

[61] installed at ZKM, Karlsruhe (archive format)

related image beneath, making explicit the interactive process of engagement. Although the interaction and idea are simple, the potential layers of meanings are many. A similar model is explored in *My World* where navigating draws a permanent trace of the avatar's path in real-time as it moves. The interfaces are intended to be simple and intuitive, gestural on a small scale, but still provide for the making explicit of the self-reflexive relationship between the viewer and the work - of cognitive interaction.

This making concrete of the conceptual allows for the viewer to construct and test hypotheses concerning the work's behaviour. In Granular Synthesis' *NoiseGate*, a huge scale, immersive and challenging video and sound installation, motion sensors tracking viewer numbers and movements affects the intensity of the images. The human instinct to solve the puzzle encourages viewers to work out the rules governing this interactivity. The artists' statement describes how this acts to

> "challenge and invite the viewer to devise their own solution to the story and method behind the images". (Noisegate, 2000 no pagination)

In this case, it is possible to construct a hypothesis and physically test it, which provides an incentive to engage and a sense of closure. This active hypothesis testing was also observed by Holmes (2000a). This model can be used to explore cause-and-effect models in the work's narrative. Thus, in *My World*, viewers discover through experimentation that overcrowding in the house makes the inhabitants fight - if some are rehoused, the fighting stops.

The extension of this model is as detective investigation. The model of Navigable Space permits the viewer to focus in on and investigate whatever seems the most interesting and then focus outwards, or jump to another area. Rather than undermining narrative, this recasts it as a process of investigation, discovery, following logical links and testing hypothesis in order to arrive at one of several possible, meaningful cohesions. This detective model was attempted in the work *Building*, which was never successfully completed. As a mechanism for discovery and exploration it worked well, but it lacked a sufficiently coherent intrinsic narrative. A more successful attempt at a detective model was used in *Map of the World*. Importantly, the latter work had a drawn, rather than photographic quality, and was more highly personalised and revelatory. These

factors contributed to its more successful invitation, and sustaining, of engagement.

Immersion and Reflection

The tension identified between immersion and reflection can be useful and dynamic. It represents one of a number of dynamic pairings which invest interactive works with life. Frampton suggests that while meaning comes directly from experience, an understanding of it comes from meditative thinking - a slow, deep contemplation of that experience. (Frampton 1996) When immersed in an artwork we are receptive to ideas, meaning, communication, but on a subconscious and involuntary level. Immersion diminishes critical distance as it increases emotional involvement, precluding the perception of the artwork as an autonomous aesthetic object. This encourages a sensational, sensual but voyeuristic engagement. The movement or dialogues between immersion and reflection; between comfort and strangeness; between emotional and intellectual are therefore important dynamics in the viewer's understanding of an artwork. Interactivity here may be used as disruption or interference, which Morse (2003) describes as a Brechtian device[62] for creating a reflective space. It permits the viewer to perceive an immersive work as simultaneously distant and present, much as in Theatre. While an emphasis on the playful tends to foreground interactivity *as* the immersion, Ryan (2001) posits a more thoughtful immersivity, something which may initially require considerable viewer effort in deciphering a powerful, original or difficult work. This suggests a slow contemplative, reflective interactivity, in tension with a more rapid activity.

Other key tensions might be provided by the collision of expectation and aesthetics with reality and behaviour. Polaine (2005) argues that interactivity does not belong in a gallery. This then suggests that placing interactive works there could introduce a powerful tension. Giving viewers permission to touch and alter, even insignificantly, the works confounds normal expectations and opens up a dynamic of challenge. Early feedback on *Window* (where the viewer is invited to alter the image by repainting colours) included the comment

[62] Brecht used Verfremdungseffekt (distancing effect) to *prevent* immersion so that rather than empathise with individual characters, the viewer would analyse and formulate a more general social awareness

"This is difficult - It feels like I'm destroying an artist's work: how do other people get round that?"[63] .

The invitation to create, to have input, to personally enter the narrative offers the challenge of two aesthetics colliding – creation and destruction, game and painting, informational database and animated movie, the iconic art object and the ubiquitous and dispersed digital aesthetic.

Viewers have an innate curiosity (Baber et al 2001). However they also need 'permission' to act, through a clear indication that there are actions to be taken, discoveries to be made. This is particularly important where a work adopts formalisms from painting. Earlier works in this study applied the conventions of iconic custom cursors and rollover object changes to indicate this. Later works sought out a more fluid and transparent way to indicate the availability, and type, of actions without didactic labelling. This follows Hughes' notion of the interaction process as a journey through a landscape, with orientation based on suggestive 'landmarks' rather than the absolute clarity of 'signposts' (Hughes, 2000). This requires an elegant compromise between a Design or Human-Computer Interaction model of effective and efficient communication through sign and symbol, and an Art model of a curious and an immersive experience.

Speed and Contemplation

The digital condition has been characterised by speed, the immediate. With interactivity, time becomes a formal and conceptual element in the language of the work. It becomes a controllable parameter, and one which can be used to confound the viewer's expectation - as in Mark Wallinger's *Angel*, where the entire video is time-reversed, so that direction (up and down on an escalator) is also reversed. Time can be used to offer an antidote to, rather than a reflection of, the presumed nature of the digital. Ross (2005) suggests this reading of Bill Viola's hyper-extended time in the *Passion* series. Later works in this study have used extended time, controls which operate slowly, offering the viewer time for consideration and investment in a decision; and controllable time, allowing the viewer to contemplate one of a series of moving images.

[63] verbal feedback from informal exhibition session, June 2006

Shawn Lawson's *Wu Wei*[64] explores a contemplative aesthetic, which is the antithesis of much computer game-inspired work. This responsive work requires the viewer to sit still, on a viewing bench, which will cause the image - a 16th Century Chinese painting - to fade in and then become animated. If the viewer stands or walks away, the work will fade to invisibility. This is an interesting model, requiring the continuing attention of the viewer, but problematic for several reasons. By using an existing artwork by another artist it, like *Zerseher*, separates the painting from the interactive process. It conflates the notion of simple presence with attention, and holds the viewer's attention by force, rather than persuasion. *Faith,* and *Passion* explored the idea of requiring continuous viewer action to maintain narrative flow or image intensity[65]. These works also attempted to foster a long and contemplative engagement through the use of gentle and realistic sounds, and (like *Window* and *Heart*) a rich and sensuous surface and an interaction style that might be characterised as 'gentle' (slow and unfolding) rather than abrupt.

Early Works

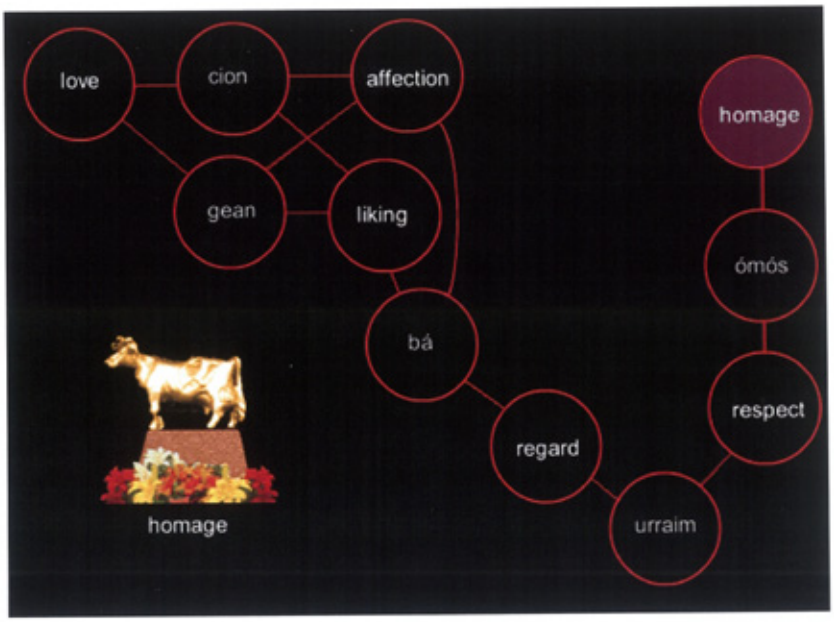

Figure 9: What?

The early stages of practice centred on the integration and centrality of the interaction to the meaning of the piece; on ensuring that the work and the

[64] archived at (CrudeOils, 2005)

[65] beyond the this 'Time Out' facility programmed into all the works. This returns the work to its start or 'resting', attractor state, following a specified period of time without recorded mouse clicks or movements.

interaction were indivisible. This resulted in *What?* - a simple information-aesthetic system, a point-and-click exploration of the problem of communication between two people. It offers a bi-lingual dictionary to translate words back and forth. The viewer must select a translation without any understanding of the difference between the choices offered. The piece charts the shifting meanings and visual representations of how far from an intended meaning a simple communication can move. However, the text basis leaves space, as in a novel, for the viewer's imagination to flesh out the bare narrative. The meaning is rendered clearer by the minimalist focus, and by the making explicit of the process, and the dynamic drawing of the diagram. The work uses a psychological model of immersivity, involving the viewer in a constructive or creative relationship with the work, but operates in the intellectual rather than affective. It is not specifically goal-oriented but can be 'completed' by selecting a series of links which will return the viewer to the starting word. It does not accept free input, and uses a paradigm of explicit choice, in which the available choices, if not their meanings, is clearly indicated. Visually its informational formalisms lack dynamics and emotion - it is diagrammatic rather than expressive.

Experiments with making the interaction more intriguing, and more complex, included the model of an open-ended narrative based on the idea of a detective story. *Building* was a hugely ambitious piece in scale and programming (for my level of skill at the time), using difficult sound cues and moving between 12 linked programs. It used text to make the uncovered 'clues' explicit and invite the viewer to add narratives suggested by fragments of story. Although amusing and challenging in a quirky way, and although it contained some accessible sub-narratives, it suffered from a lack of any real focus. It used a Navigable Space model, but confused the notion of open-ended exploration and collection of ideas, images and objects - the playground model - with a goal (to get out, without being 'arrested'). The controls were gestural - roll the mouse to navigate the space as if by walking, and offered simple real-world models -click on door handles to open them; if the viewer collides with a wall, she hears a thud and the cursor icon stops moving. However, they proved too difficult, not least because the viewer must begin in total blackness, a blank screen. More importantly, the piece was insufficiently seductive to encourage the viewer to

overcome the difficulties, and the model of what the viewer was supposed to do (and why) was unclear.

Cut-Down Dialogic Models

A more affective work might be arrived at through deeper consideration of the character of the interaction - of the computer's character or role in it. Computing's human dialogue model implies continuity, and for the work to have remembrance of past exchanges, intentionality and the ability to negotiate. Whilst this is not fully achievable in a computer-based work, the dialogic model is still tempting as intuitive and accessible. Elsom-Cook (2000) offers a modified conversational model as a reciprocal process between two intentioned agents, each attempting to effect some change in the other, in the context of some internal goal.

This suggests partial dialogic models, such as those offered by Ritual or by 'active listening'. In Ritual, the symbolic utterances or gestures may be entirely predictable and unchanging but are rich in meaning and a sense of active contribution. These are associated with the non-rational, or affective - and participating in rituals releases endorphins, producing feelings of pleasure (Schechner, 1993). For Boocock (1974), ritual also implicitly contains the notion of a search for meaning, and the reinforcement of some sense of belonging to a community.

Weizenbaum explored the listener model through virtual psychoanalyst ELIZA. Originally intended as a parody, ELIZA adopted the analyst or confessor's limited dialogic materials and a suppressed intentionality. This generated a powerful emotional attachment in her users (Weizenbaum, 1976). Although simplistic, she offered the speaker permission to continue and facilitated clarification of the speaker's own meaning. This model is used in *Automatic Confession Machine* (Garvey, 1994) as both a processual artwork (in which viewer's confess sins through a simple text-based interface, and receive absolution) and an enquiry into the nature of faith, and the commodification of spirituality.

Ritual suggests the possibility of a 'dialogue' which though limited and predictable is highly meaningful and emotionally engaging, based on prayer. In this model the Deity's responses are given implicitly, silently - or derived evidentially from subsequent events. Understanding of these may be realised internally, in a process comparable to an internalised cognitive interaction with artworks. Church rituals additionally offer a sense in which separated participants are conceptually connected - the principle of Communion -, so that both celebrant and communicant are symbolically linked to all other celebrants and communicants taking part in services, even asynchronously. The tension between the formulaic rigidity of the ritual actions, and the freedom derived from immersion in them is an important principle for interactive artworks.

Typically a ritual is a multisensory experience involving sight, sound, smell, taste, touch and movement. This may centre on some sacred or charismatic object. Freeland (2001) argues that the reproducable nature of digitally based works strips them of their sacred or fetishistic object status. However, Hills (2002) points out that the sacred object may itself be banal, but is possessed of some enigmatic or obscure quality, an ambiguity that prompts a search for meaning. Nightingale describes the rituals of the fan-impersonator, in which she finds a

> "priestly role for the impersonator...(who) delivers the Eucharist, the signs of an Elvis-Christ: Elvis music, visual spectacle, kisses and the sacred scarves distributed at impersonation concerts" (Nightingale, 1994:221)

This establishes that sacred or charismatic status is not tied to a unique or authentic original, but representations, or enactments - copies - can carry the power of the original they symbolise.

Couldry (2003) defines a parallel model of Media Rituals, formalised and symbolic engagement with TV as a means of managing conflict and mediating self-definition; a simulation of life, through membership of an actual community. Viewers of major real or fictitious events experience participation shared by thousands or even millions; through an actual interaction, such as in the recent Live8 concert[66], or the conceptual uniting of viewers of the televised funeral of

[66] (BBC TV, 2.7.2005). Viewers were asked to text their names as support for a world-wide

Princess Diana (Ignatieff et al, 1997). These establish that a meaningful and a highly emotive participation can be perceived even in a solitary viewer, and through the filter of the screen.

A partial dialogic, human-animal interaction model is used in Tamagotchi[67], simple computer pets which endow an inanimate object with life. Humans tend to view computers as entities, and anthropomorphise them in interactions with humans (Morse, 2003), to treat them as social actors even when they are aware that this is inappropriate (Nass et al, 1995), and to perceive them as having different personalities (Fogg, 1997). This human tendency to anthropomorphise and to identify with proto-creatures permits viewers to become emotionally engaged with even simple applications, and to project our experiences and feelings onto the works. Max Dean describes the audience's response to his *Table*, an apparently normal table with image recognition and movement capabilities, which can identify an individual viewer, and engage in a 'dance' with him. The table appears to be trying to form a relationship with the viewer and this invests the work with emotional affect. Dean quotes a viewer's response

> "I don't think it likes to be touched" (Dean, 2004).

Aspects of anthropomorphisation are explored in several works - *Pet God, RealityTV* and *My World. Pet God* uses cut-down dialogic models to communicate with the viewer through text. The viewer's input must be formulaic 'prayer', following instructions in the prayer book. This attempts to make a virtue of the computer's dialogic failings. *Pet God* responds to accumulated actions - perceived as the giving of sacrifice, following or failing to follow instructions, or repeated requests - and employs chance to simulate a simplistic deic agenda. It provides answers to 'Frequently Asked Questions' and more oblique responses to open requests, providing the formula is followed. The model here is open-ended, and although visually the work offers a pictorial representation of the deity, interaction is by way of an informational, text input. It is open-ended, but the deity has a simple agenda of its own, so that control is shared between viewer and computer.

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petition - and could then watch to see if their name appeared on the LED display behind the main stage. Finding my own name there generated a disproportionate sense of participation.

[67] Bandai, Japan 1996-8, information on these can be found at http://www.bandai.co.jp

Pet god was constructed to filter out the more common obscenities - a common problem with visitor and online interactives. A comparison between Public or Community Arts and acts of graffiti and vandalism suggests the 'legitimate' participation of the viewer can be encouraged in specific ways. Giving the work some general personalisable relevance, making it accessible and understandable rather than threatening can encourage the viewer to develop a relationship with the work, establishing an emotional connection through a sense of ownership. Contextualising it as Art rather than Game and encouraging a lengthy, rather than instant engagement may encourage a more thoughtful interaction. Limits, mediation and resetting will prevent one viewer from highjacking other viewers' experiences and allow them to engage on their own terms. All these have informed the direction of the work in this study. *Pet God* is intended to be installed on an individual's computer as a personal individual instance. This required a long-term engagement, which is problematic in terms of how to initiate engagement.

Figure 10: Original Pet God

Although fairly simple, this piece represented a steep learning curve in finding easy ways to store accumulated information and appear to have a continuous existence while the application is not running. This was part of an ongoing attempt to push the limitations of the chosen software. Further developments would permit *Pet God* to recognise individual supplicants via hidden information.

The piece is intended to critique the human view of the Computer (and the generic monitor/TV screen) as a source of all information, experience and power, thus the interaction can be seen as metainteractive and intrinsic. The pace of the deity and its actions was designed to be slow, to introduce time for reflection; to demand patience. This work contained a tension between the humour and the demand for the viewer's contemplation. This helps to create a distance from any emotional reactions, allowing for the viewer to analyse them, and the relationship as a whole. However, while it successfully demonstrated the partial dialogic model, and offered a more complex range of interactions, formally it was stilted and visually confusing. It was insufficiently emotionally engaging, and viewers in early tests found it difficult to understand how to interact. A subsequent rebuild of the piece, maintaining key programming decisions but simplifying the mechanisms and with a richer visual form was more successful but retained the conflict between humorous play and intensity. This conflict suggests the use of humour, of laughter as a counterpoint to contemplation, and as an element of dramatic pacing and tension and an impetus in moving between reflection and action.

Figure 11: Pet God 2 - Made After the Investigation of Interactive Painting

The attempted remake used one of the strengths of the medium, retaining the programming but replacing visual assets. The process was not entirely successful, privileging a modular scheme with discreet elements rather than a holistic model. An integrated work is not open to the same level of change, but needs to be designed with the intention of interchangeability. Moreover, the

attempt made it clear that behaviour, responses and movement of individual elements need to be related to their specific visual form, and style. Thus the remake became a significant reworking.

At this point in the study, I was focussing on ways of integrating interactivity and facilitating a richer, more varied interactivity than simple point-and-click, which could be controlled by standard devices. I wanted to push the limits of the mouse, and keep the interaction mechanisms simple and recognisable so that interactivity would be a conscious decision, engaged in by a definite choice. This approach emphasised the communicative, rather than the visual or affective.

A number of works were created using a simple, flat, cel-animation aesthetic which aimed for focus, and for immersivity, creating a contemplative space through sound and colour, and conceived formally as a sequence of images which can be explored slowly and spatially. *DIY Religion* was an exploration of the elevation of such new deities as Football, Technology and Money, and was ambitious in scale. I originally created this work in two versions, a computer animation with a fixed narrative, and an interactive Navigable Space.

Figure 12: DIY Religion - Resting Screen

The intention was to exhibit the two pieces separately and gain comparative feedback from viewers. It rapidly became apparent that whilst an interesting exercise, this would be a flawed and unsuitable one for the area of study. The two pieces of work are quite simply different pieces, and it is not possible to conduct a "control experiment". Corby's suggestion here is important; that the success of an artwork cannot be scientifically quantified. He characterises the process of practise-led research as essentially organic and divergent, as implicative rather than testable (Corby, 2000). This was a contrived experiment, although useful in reiterating how the nature of the work needs to determine the materials and approach. In terms of my own emotional involvement in the process, the interactive work offered the greater challenge but also the more frustration and the more time spent on non-visual thinking. The blandness of the flat colour in this work makes the eye slide off it; despite the intricate detail and rich colour, the viewer's eye and attention is pushed *around* the surface of the image rather than down into it. A more textured and painterly, more sensual approach would better encourage contemplation.

The interaction mechanisms attempted to model reality but this proved hard to conceptualise properly. A crude model of lighting on-screen candles to generate another shrine could clearly have been constructed in a hybrid interface where real candles and a local light-sensitive receptor functioned as an input device. However, I wanted to keep the viewer's attention within a single, engulfing image. The interaction model was of a navigable space, but limited, essentially moving between fixed sites or temples. Each temple contained an activity, offering a variety of pacing from the rapid, suggestive of a simple game (catch the money as it rolls past and gain consumer goods) to the creative or personalised (draw your own deity, and worship it by playing the gongs). The juxtaposition of these activities with the slow, contemplative 'resting' screen offering a sense of calm through naturalistic sound (wind, gongs) and gentle motion (moving clouds and fluttering flags) was not well resolved.

At this stage there was still a tension between attempting to accommodate 'recommendations' coming from other research inputs, and the practice-led process of exploring the medium and its potential. *Reality TV* was created as a reflection on the Big Brother/ Reality TV phenomenon and involves cartoon

characters engaged in a small stock of activities uninteresting to watch – eating pizza, drinking, occasionally getting drunk, watching TV, sleeping[68].

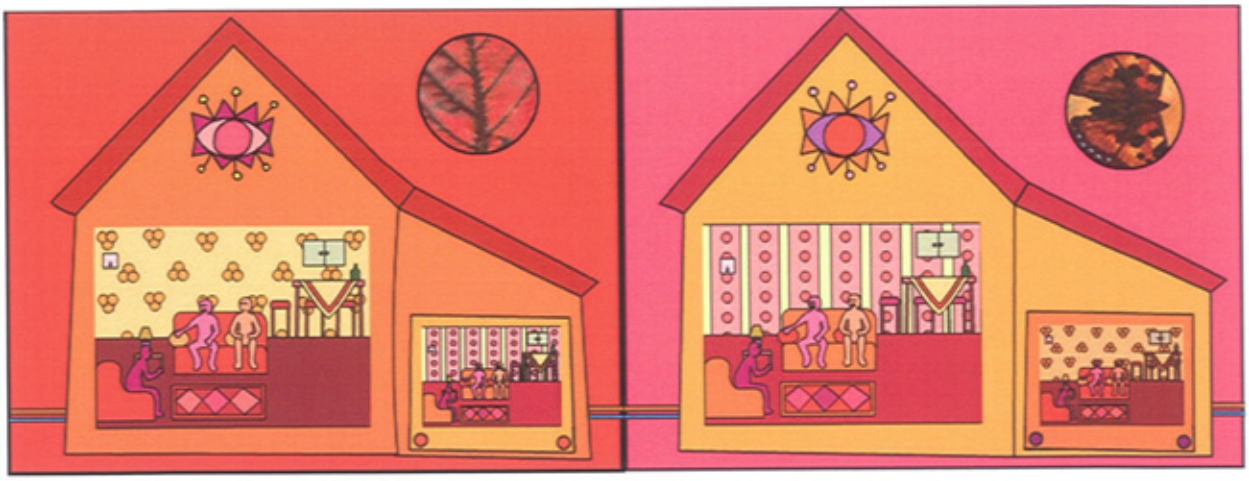

Figure 13: Reality TV

The characters in one house watch, on TV, the characters from another house performing similar actions which the viewer can control by simple click or drag operations (turn off the light, drag in the wine bottle). The characters' attention spans are limited; occasionally they appear aware of the viewer but they do not remember her past actions. They do not inquire as to the causes of disruptions in their world, and are oblivious to the changing elements of photographic "reality" in the background. This renders the viewer's interaction not significant (in Laurel's terms), and the world always returns to equilibrium.

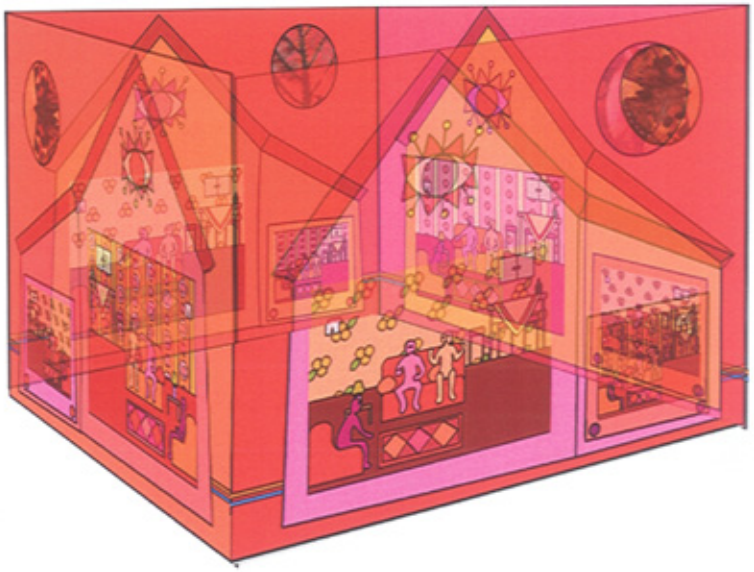

Figure 14: Reality TV Installation

[68] I subsequently discovered a Finnish TV series Akvaario (YLE/Helsinki University of Art and Design 1999 Directed by Teijo Pellinen) - a late-night "drop-in", driven by viewer telephone votes which offers a live action anti-narrative uncannily similar to this piece. This is described in Hales, C (2002) *"New Paradigms<>New Movies:Interactive Film and new Narrative Interfaces"* in Rieser,M & Zapp, A(Eds) *"New Screen Media:Cinema/Art/Narrative"* British Film Institute

The content translates well into this form, and the interactivity is intrinsic. It was intended to be active rather than contemplative and links between action and response are much faster than in *DIY Religion*, with a sense of pace and confusion to be resolved. This is reinforced by the intended installation - four linked houses on four large screens surrounding the viewer - and the necessity of sharing one mouse between two screens. The latter is intended to promote co-operation and interaction between viewers, to mitigate against the more 'guerrilla' interactions of the viewer. The interactivity with the work itself, however, remains the focus. The interaction model is open-ended, and the characters' occasional appearances of autonomy help to suggest a cut-down dialogic model using actions. This is more fluid and intuitive than the model from *Pet God,* but the figures are not individualised - having no characters, they are hard to identify with emotionally and the overall effect is of a viewer-controlled narrative or playground, in which the viewer plays God with toy people.

This was an ambitions piece in terms of both programming and framing, and began the process of considering the ultimate framing of all the works in the study. A domestic scale of creation (desktop monitor, standardised input controls) need not necessarily imply exhibition on a monitor. Projecting the images allows a sense of scale and inescapability, suggestive of the inescapable nature of bland and self-reflexive entertainment. The complexity of this piece implied not only a lengthy debugging process, but also a change of role; a perception that reflected the theoretical shift from artist towards designer or engineer. Up to this point in my art practice I was still painting and constructing real objects and the formal qualities of the parallel practices - flat colour, cel-animation style, saturated colour, symbolic representations - can be seen to influence each other.

Figure 15: Sacred Object - TV

Interpretation

Interactive works offer the possibility of integrated interpretation. Through the course of developing the practice it became clear that the notion of an integrated, artist-controlled, time-based and interactive 'labelling' could be used to offer layers of explanation or expansion; of suggestive linked imagery and detail. This would allow viewer interpretation through an emotional, rather than an intellectual process. This idea was explored in *Map of the World*, and subsequently in *Heart* and *Passion*. *Map of the World* was an exploration of memory and intimate space, through a symbolic and pictorial map of a personally significant space and time. It uses an open-ended Navigable Space model, with a natural gesture - a simple roll of the mouse - to mouse around the world (which is several times larger than the screen size). Objects alter when rolled over, coming into focus to reveal more detail in a simulation of nearness. It also uses a semantic link model (from HCI). This uses iconic cursors to indicate the type of response the user will get from different control objects. It provides a non-didactic interpretation in the form of some small text-and-image based narratives. Rather than literally explaining or contextualising the piece, they offer areas of detail. These used stereotyped images of family scenes and simple repetitive texts in the style of 1950s and 60s children's readers, contrasted with a more personal style of writing from memories. This offered viewers identification with that which we may hold in common - childhood experiences and dilemmas.

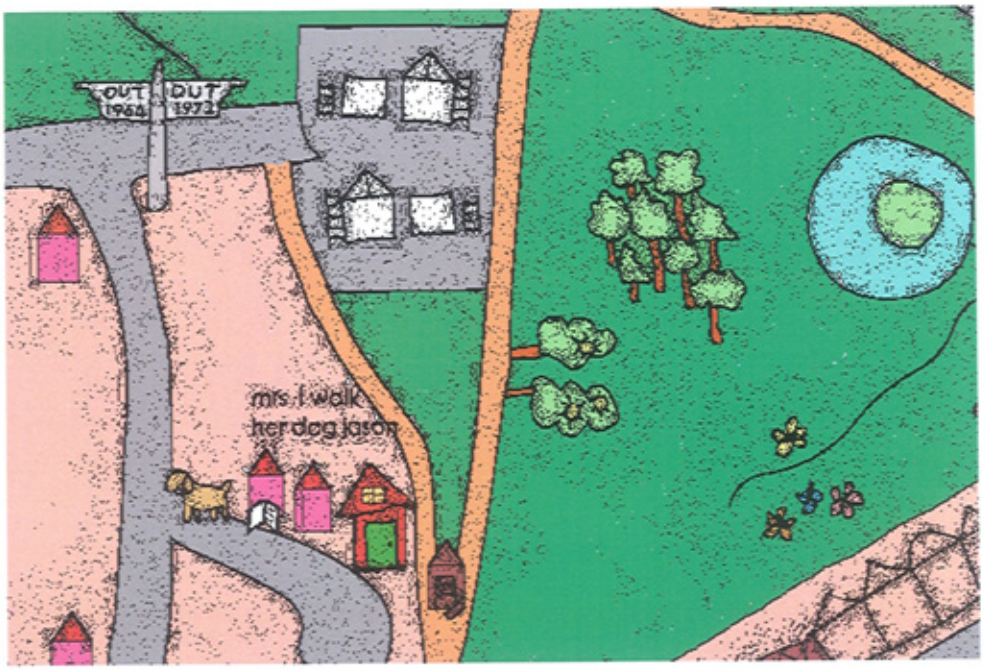

Figure 16: Map of the World - Storybook Cursor Links to Side Narratives

Intimacy

Allowing users to play with artworks normalises them - renders them more familiar and less idealised, permitting an intimacy that encourages greater knowledge and emotional attachment. The physical connection, and the process of developing understanding of the work and its behaviour help to generate real emotion in a simulated world situation. Interactivity breaks down the distinction between subject and object, permitting an identification and enabling the viewer to see herself in the work. Kendall described his interactive writings as a way to both

> "simulate ... the volatility of emotional states" and to "let the reader experience the volatility of these elements directly, rather than just digesting my description of them" (Kendall, 2001: no pagination)

This suggests interactivity reintroducing a first-hand and (relatively) unmediated experience. It compares with Morphet's description of Painting's attempts to "produce an image sufficiently concentrated...to constitute...an independent equivalent of the original experience" (Morphet, 1984:22)

Emotion and sensuality experienced vicariously or virtually can be powerful, cathartic and compare well with the actual experience. Lynn Hershman's early interactive video pieces (*Lorna, A Room of One's Own*) used interactivity "to combat the loss of intimacy brought about by the dominance of media such as ...television" (Jordan & Packer, 2001: xxvii). The footage of characters appealing directly to the viewer as if in person established a context of confessional or of voyeurism within the narrative.

Petterd (2003) describes a model of gesture-driven interactions based on the normal, natural activities of a viewer in a gallery - walking, pausing, watching, and moving between works. This offers a comfortable, physical familiarity yet also represents a puzzle to be solved. Intimacy works against the Art Historical model of the power of art objects to make the familiar strange, unexpected and provocative - particularly as the medium becomes even more commonplace and normalised. This suggests using the tension between the familiar and intimate, and the strange and disturbing to alternately seduce and repel, to move between immersion and reflection.

When the viewer performs the work, the intimacy extends to the viewer's becoming part of the work - both its form and meaning. She must act out the work and therefore must make some interpretation of it and make this explicit through her 'display' to other viewers. Performing the work implies a deep understanding which will develop through the performance - the conceptual model of understanding-by-doing.

Map of the Work uses the small and intimate, highly personalised as a way of encouraging viewers to reflect upon their own personal memories, permitting introspection or confessional. Stylistically it is graphic, cartoon-like although the small scale offers some intricacy. A 'happy accident' (inadvertently saving an image at maximum instead of minimum compression) produced flaws which could then, using the computer's colour mapping ability be rendered as a series of black dots – reminiscent of the effect of drawn monoprint but identifiably a computer mark. This suggested the beginnings of experimenting with the medium as a drawing or painting medium, to find its characteristic, essential qualities.

After *Map of the World*, I discovered the online *PDPal*, (Paterson, Zurkow, Bleecker, 2003) which looks at personalised visions of a hometown and questions what is important there, and why. It makes use of the impersonal and generic in an attempt to allow viewers space to imagine their own details, to personalise the image.

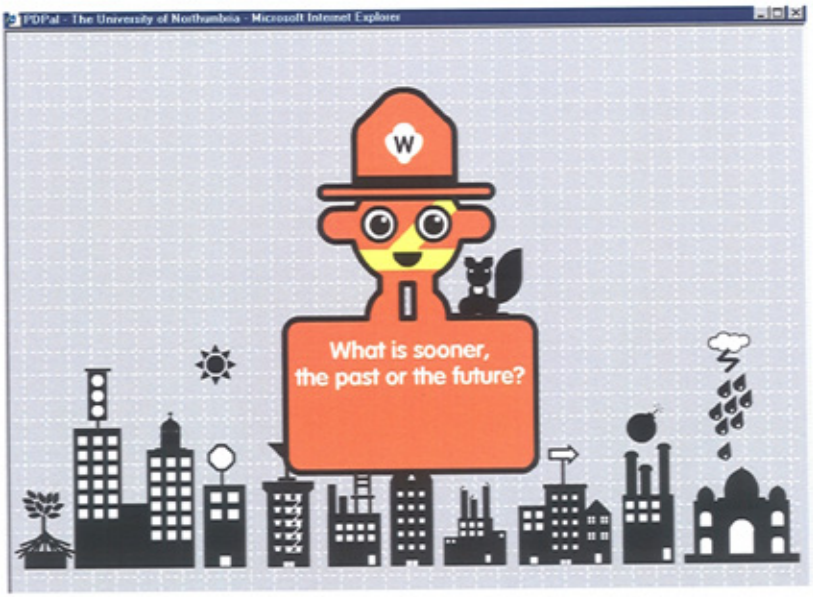

Figure 17: PDPal Screenshot

PDPal uses an Extensible Database to add viewer input and make it available to other viewers. It links participants in real space (the actual city) in a collaborative work, mediated via the network. Rubberstamp style graphics offer a symbolic or diagrammatic representation of the viewer's personal feelings rather than a pictorial interpretation. The emotive content is generated rather via the text, using the avatar as agent provocateur to make explicit the call to engage through provocative or surreal questions.

Map of the World keeps the call implicit and the individual's images and mappings internalised, but attempts to create an atmosphere of intimacy in which the viewer will feel safe to reveal, and explore, personal secrets and memories. It also represents a solution to simplifying large amounts of information to make it accessible to the viewer. The 'comic book' style clarified the narrative and overall context, and allowed for the inclusion of the unexpected and humorous. This helped shift the viewer between immersion (exploration of the world) and reflection (through the written reflections, and the need to build a bridge between the two). Ultimately, the form seemed too bland, and left me wanting something richer, more expressive and less representational.

At this point in the practice, I began to search explicitly for ways to overcome an identified coldness, or blandness in the medium. I made some experiments with photographic interfaces and interactivity reduced to its simplest. The most successful, *Skin*, was a screen filled with flesh which reddened when touched by an on-screen finger, then slowly faded back to its original colour. Test viewers felt disturbed by the sexual suggestions of *Skin*, which intentionally referenced the manipulation of one human by another, and the virtuality of much human contact. Although very simple and intuitive to use, with a kinaesthetic interaction simulating direct touch, the programming and sequencing of images was surprisingly complex. The images referred to sensory experience, and thus could recall it through the viewer's active engagement with memories. However, they were not of themselves truly sensuous. Viewer input made no permanent change; it seemed to reinforce, rather than remove the glass wall, and to reflect the pointlessness of attempting communication.

Exploring the Medium

The midpoint review provided an opportunity to examine the shifts in my practice and role, and to consider how the idea of emotional engagement translates from a physical and sensual process of painting to the notion of interactivity. I realised that I needed to commit emotionally to the computer - to humanise it. Giving up the studio with its seductive dirtiness and smells was an important step; difficult but ultimately essential. It clarified that the works to date had concentrated on the programming and mathematical potential of the computer and needed to engage more with the visual, to explore the visual possibilities of the computer as medium.

In a mixed-media arts practice, the idea dictates the medium and approach. An artificial requirement to make works interactive prevented some good ideas being developed and forced others towards the contrived. Therefore I decided to allow myself creative playtime, to follow narrative ideas for which interactivity was not intrinsic in order to explore the visual aspects of the medium and rekindle some of the passion in the process. This allowed a concentration on the visual rather than the behavioural. A period of experimentation progressed from pure video through manipulated animated photos, hybrid video-painted-text and finally to a work conceived of as an animated painting. The latter was an exploration of modular elements: how a complex image can be broken down into re-usable objects and animated. It began the process of exploring the computer as a gestural painting medium. These were valuable lessons also in the use of time as a medium in maintaining pace and balancing dynamics, which proved difficult to gauge.

Video was frustratingly slow and counter-intuitive to work with at the editing stage – it could not be directly manipulated and therefore felt distanced and dispassionate. Animation was more intuitive, taking drawings or paintings and adding a time dimension. The visual quality was often disappointing, due to the constraints of format and compression. Controlling the computer was a challenge when trying to use it for something other than what the software designers intended. However these problems can be overcome with time and familiarity. The loss of physicality can be compensated for by an experiential gain, using scale, intensity and sound as aspects of immersion. This 'free play'

resulted in a more free approach to the materials, and to the reinforced understanding of the benefits of interactivity as a means of allowing viewer control in pacing and focus, and in establishing and understanding causal and semantic links.

The most satisfying and successful of these non-interactive works, in both narrative and formal terms was the looped animation *Skeletoon.* Inspired by Mexican Day of the Dead artefacts at the British Museum, it began with a visual, rather than conceptual idea. It explored the possibilities of combining drawn imagery with texture sampled from manipulated photographs, of combining flatness and texture, and using a cut-down colour palette. It developed organically, using the software as a drawing tool rather than a programming one. Although not optimal in terms of memory or processor use, this allowed a creative process closer to the process of making a painting or drawing.

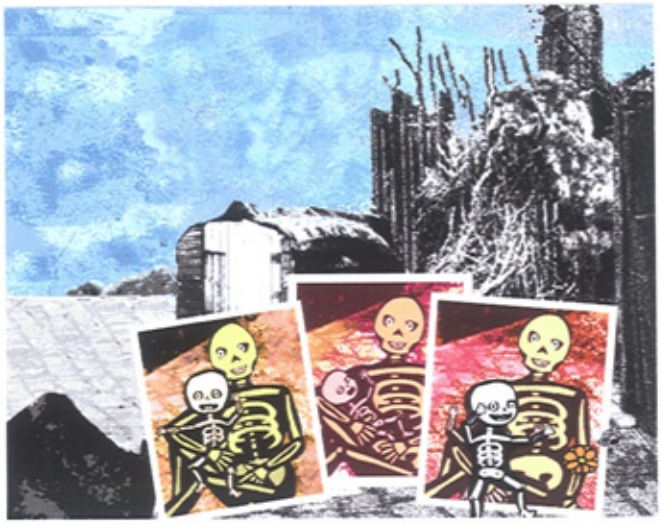

Figure 18: Skeletoon

Skeletoon also introduced sound as an element of both pacing and immersivity, demonstrating the emotive potential of sounds and the power of colliding virtual and abstracted imagery with real-world sounds. Hybrid interfaces which embed interaction controls in real objects with texture and smell, within a physical installation makes use of the power of sensory input, particularly movement, sound and smell, to trigger powerful memory and emotion; to humanise and poeticise the machinic. Vibeke Sorensen's *Sanctuary*[69] uses water (into which the viewer must dip her hand), plants, and chairs (on which the viewer must sit) as interface devices, intended to reinstate some physicality, and sensuality into

[69] archived at http://visualmusic.org/Biography/SanctuaryInstallation.htm

a computer-based interaction. Hybrid interfaces permit a powerful metaphor - open a real box, and out fly projected memories - which contains a suggestion of magic. Sound offers a third dimension to a wall-based work and supports the temporal dimension of interactivity. This idea was taken forward in *House of the Spirits, Faith* and *Passion*.

The development of the work was also informed by a software training course undertaken as part of my lecturing work. Working outside of my art context again granted permission to explore interaction for its own sake with no meaning or ultimate purpose, and try out some unusual interaction methods in a small-scale context. This helped with developing efficiency in programming, which in turn helped return emotional engagement in the process. The training course[70] also suggested the use of gradual feedback - which, rather than 'popping-up' in the tradition of HCI or Flash applications, appeared and disappeared more gracefully, using the blend (opacity) function. This valuable sidestep resulted in two directions - the specific idea of a user-controlled animation with small narratives and the idea of an interactive that was also a painting. In this, I wanted to push the boundaries, not to rely on the 'easy' route of manipulating images but creating from scratch and regaining the physicality of the process.

A Longer Engagement

It seems much easier to get film or animation shown; and there are more festivals and exhibition opportunities than for interactive works. Viewers in gallery settings seem more comfortable with the genre, which permits a more passive watching, an immersion more easily achieved than in a work through which the viewer must make her own journey. In a gallery situation where static images were exhibited alongside film or animation viewers noticeably clustered around the moving works: Sam Taylor-Wood's *Still Life*, the only moving image in a room of paintings (and without seating), at the Tate Modern (June 2006) and Chiho Aushima's *City Glow* the only animated work in her solo exhibition at the Baltic (January 2007). Early feedback from participation in the group show *We are Transparent*[71], where interactive and animated works were shown

[70] Macromedia multimedia (software-based) training at Sunderland University, taught by Gurpreet Singh

[71] "We are Transparent" - women artists using technology, Waygood Gallery November 2004

together indicated that the animations or films had a more direct and spectacular appeal than interactive works; and that viewers gravitated towards the rapid or intense rather than the gentle or contemplative. Obviously, this tendency was in relation to the juxtaposition - and competition - between the two. Where interactive works are compared with non-interactive static images, Graham (1997) found viewers spent longer with the interactive works, and fewer viewers who gave the works only a minimal engagement[72]. Holmes (2000) made similar findings in viewer responses to her work *Nosce Te Ipsum*. 82% spent more time looking at the interactive work, and watching the other viewers look at it, although only 22% felt this to have been a more exciting experience than looking at paintings. Meadows describes interactivity as offering a means of adding viewer investment, of time and attention, starting a spiral development:

"the process of investment...allows someone to increase his interest, and his interest is what sustains his investment" (Meadows 2003:231)

Besides a longer engagement, interactive works offer explicitly multiple, differentiated experiences to viewers, who may therefore make multiple 'visits'. This relates to the notion of replayablility - the potential of a computer game to engage because it provides a different experience for different players or subsequent usages by the same player, and thereby supports progression and development of the player experience. (Iuppa, 2001) Against the critical view of New Media as essentially mutable and open-ended, Meadows (2003) observed a human need to find all the possible answers or meanings, suggesting a desire for closure. The works in this study are small in scale, intended to allow an exploration of the whole work, so it is seen as a totality.

What?, exhibited at *We Are Transparent*, was intellectual and visually spare, so competing poorly for audience attention with the more spectacular works having the imperative of linear timelines and the immersivity of sound. Importantly, it raised the question of how an interactive work looks when it is not active; how it attempts to invite the viewer's engagement. Although interactive works may be regarded as only complete when being interacted with, and they do not offer a

[72] Her studies found dwell times of up to 90 minutes in some exhibits, with averages of between 1'52" and 18'18". She found less than 2% spent 30 seconds or less at an exhibit, compared to 64% for non-interactive exhibits.

'snapshot' immediacy, yet consideration needs to be given to the initial visual appearance - the 'attractor mode'. Shedroff (2001) points out the need for good participative interaction to contain a dramaturgy of attraction, engagement and resolution. This happened fortuitously with *DIY Religion*, but needs to be explicitly considered, if a work is to be considered as if, or *as,* a painting.

User Controlled Animations

Worlds were created entirely in Flash and simplified the image to cartoon-like interlocking shapes reminiscent of Paul Klee or Keith Hering. The interaction is a simple choice - choose a character (by clicking) and see what it does, although it also offers some kinaesthetic interaction as rolling the mouse over the characters causes each to change colour, to come into focus. Each action is self-contained and returns to equilibrium, a resting screen. This is in constant, slow motion, and offers a contrast in pace to the rapid action, permitting a shift between a more contemplative, reflexive space and a more active, immersive one. The work allows the viewer to focus on a single thread of complicated real-world interactions, making that focus visually explicit and isolating it so it can be examined. They make explicit the interconnectedness of people, and how each one's action affects others. In *World 1*, the effects are simultaneous. In *World 2*, they move outwards in a ripple. Ultimately, this viewer's control is illusory: the world has its own pattern and a single person's power cannot override the whole balance of interdependence.

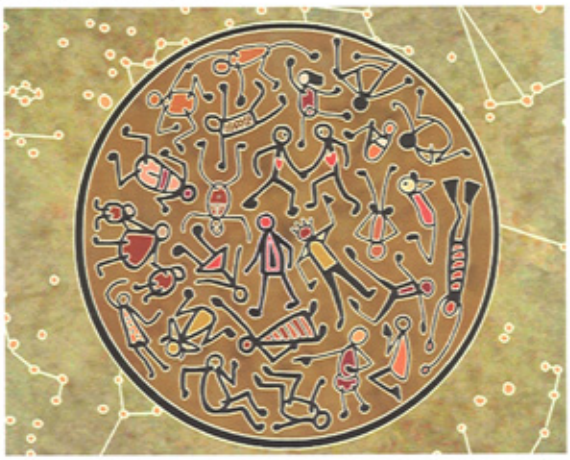

Figure 19: World 1 -1st Version

This piece suggested the idea of being shown on a wall-mounted monitor, as an animated "painting" which can be controlled by the viewer via a trackball/ mouse - the simplicity and speed of the interactions and the minimalist cartoon style makes it possible to view this piece quickly - standing up. Such framing helps to

contextualise the work as Art rather than Game. This type of framing was observed in Sam Taylor-Wood 's non-interactive video *Still Life* - and more recently as part of Julian Opie's *Walking Dancing Undressing Smoking*, where it appeared to function as a 'window-display' of a 3D-lenticular drawing series and was not listed in the catalogue as a work in its own right[73].

Figure 20: World 1 and 2 - 2nd Versions

A re-working of *Worlds* later in the study offered a richer, bitmap-based and more textured surface, with better depth and focus. These later versions were intended to be projected, enabling a breaking out of the rectangular frame and a removal of the glass wall. This gave them a greater affective engagement and immersivity, whilst retaining some of the humorousness and speed of the originals. The speed offers replayability, since it is hard to see all the reactions of the characters in one run of the animation. The scale of projection opens these works for other viewers, allowing 'second-layer' viewers to see 'first-layer' viewers' performance of the piece; thus it begins to move towards Hughes' idea of carnival.

This reworking made use of the computer's ability to automatically generate image series from vector animation, and to save settings for batch processing. This remained, however, a lengthy process and the final product made far less efficient use of processing power and memory than did the originals.

[73] Alan Christea, October 2006

6. Answers - Interactive Painting

> "It is precisely the onset of higher orders of technology...which allows us, by rendering old techniques outmoded, to grasp the inner complexity of the mediums those techniques support" (Krauss, 2000:53)

Painting

The experiments with visual qualities undertaken in the animations suggested taking a more painterly approach, rather than trying to make 'Interactive Art', remote from the previous body of work. Through the development of new works, and particularly *My World*, the idea of rekindling and encapsulating emotion, and the idea of returning to painting, became fused.

Manovich suggests emotion has always been central to art until suddenly 40 years ago emphasis shifted to the textual and semiotic and now

> "we have a vague hope interactive art will bring emotion back"[74]

In fact, interactivity can afford deep emotional engagement through intensity, pace, involvement and a sense of veracity but it has become increasingly apparent that this will not work without a powerful visual dimension. Film and Video afford a high degree of emotional involvement through the use of the human actor, and a presentation of emotion, underscored by filmic and pictorial conventions of pace, camera angle and lighting. Wand (2002) suggests applying these latter aspects of filmic tradition and language to interactive narrative to offer the viewer subtle or subliminal clues through small changes of pace, colour saturation or timbre. Painting suggests an alternative way to humanise the screen through the human gesture. This then suggested the necessity of looking beyond New Media and Computer-based models of Art to look specifically at Painting - both traditional and digital.

Research trips to London in 2005, 2006 confirmed that painting was alive and well both as financial and cultural commodity - in Cork Street and in the Tate Modern's Weston Gallery. Interestingly, in spite of the difference in media and form, the most exciting paintings, and those most relevant to my own practice at this stage, seemed to be those of Rothko. These sought a meditative, solitary experience through texture, luminous colour, and depth: a muted, non-

[74] Speaking at the User Mode Emotion Conference, Tate, May 2003, discussion session on Data Aesthetics

aggressive intensity. Without figuration or clear gestures, the eye seeks depth, identifying subtleties of colour. Sandler (1992) describes this as seeking a transcendental experience, a spirit of myth which acts as a release from the banality and bustle of everyday experience. This notion of a simple expression of a complex thought is something I aim for - to pare the works down in terms of figuration or narrative but expand the suggestive and contemplative.

The growing success of the Stuckist movement[75] and the surprising recent *Triumph of Painting* shows at the Saatchi Galleries evidence a re-growth in Painting. In reviewing this show, McKenzie suggests

> "painting continues to be the most relevant and vital way that artists choose to communicate". (McKenzie, 2005 no pagination)

But what - in the 21st Century - is Painting? The ubiquity of mixed media, and artists whose practice, like my own, spans media underlines the notion of a generic Postmedium 'Art' described by Schwabsky (2003). The traditionalist moral imperative to maintain old media free from taint by the new, typified by Kuspit (2004), suggests a fear that along with the bad (narrow and stultifying definitions of limitation) we may lose the good, the slow development of an ancient and continuing human activity which values the enigmatic over the banal. He suggests

> "It is the body - its rhythms, activities, growth, materiality - that is implied in painting...(painting is) an expression of personhood and individuality, perhaps their last refuge" (Kuspit, 2000: 2-3)

Elkins (1998) suggests that in the end, painting is about materials; their sensuality and the transforming magic of paint which he compares to alchemy. Schwabsky suggests that conventional materials, like the conventions of drawing, colour, image, and even evidence of the artist's hand are no longer essential. Painting, he suggests, is concerned with style - with the tactile, the sensual, the direct experience and the relationship between matter and sensation.

Painting thus emphasises both the visual and the sensual, focusing upon the body as much as it does the eye. This is entangled with a view of the painting as object, as commodity, rather than any particular style. Freed from the strict

[75] at the Liverpool Biennial(2006), and through a proliferation of 145 affiliated groups in 36 countries

rules of abstraction, or a single overbearing 'ism', it can look back through its own history and re-enter and reinterpret from almost any point, or engage with the digital zeitgeist and the overwhelming pool of images in the public domain. The Stuckist manifesto, which McKenzie's comment paraphrases, suggests Painting as encompassing the subjective, emotive and the spiritual, characterised by energy and truth and the transcendence of the object through interpretation. (Childish & Thomson 1999)

Ritter (2001) suggests that even 'traditional' painting is now coming out of its frame, and its self-referential purity, citing Ofili's work as a synthesis of painting with folk art, mythology and appropriation. This might describe the direction my own work has taken, although the formal results are very different. Meanwhile, overviews of what Painting, or Art, is or should be - and therefore what critiques apply - remain subjective (or as Schwabsky would have it, fictitious). Outside the self-contained world of New Media critique, Art History rolls on - Hopkins (2000) offers a review of Art since 1945 which has nothing to say of New Media at all, and only one dismissive sentence on the internet. It is clear that critical models, and concerns for Painting and for Interactive Art are very different - but they are not necessarily irreconcilable. Later interactive art - such as Sorensen's[76] - emphasises the human, the spiritual, and the intuitive gesture, even if the imagery is more photographic, more representational than expressive. A recent series of exhibitions at ZKM highlighted the influence of Painting on other media, culminating in *The Expanded Concept of Painting.*[77]

The Tate Gallery's Turner Prize blog *Is Painting Dead* reveals key disagreements typified by these postings

> "Painting is alive and well - but irrelevant... just because you digitise your painting doesn't make it relevant, just virtual"
> "Why does it matter if a piece is made on a computer or by paint...if a piece is relevant, it's relevant"
> "Painting is not dead...perhaps to the critics painting is simply redundant, stagnant...is it not down to the artists to prove... that painting may still be re-invented?"[78]

They point to a need to re-define painting in relation to the digital.

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[76] see page 98
[77] *Imagination Becomes Reality,* ZKM 2005-6. archived at http://hosting.zkm.de/imaginatione
[78] all quotes are from postings to the Tate Online Forum, "Is Painting Dead?" 2002, archived at http://www.tate.org.uk/forums/thread.jspa?threadID=1&tstart=0

Berkenwald (2002) found a significant division between artists working in digital and in traditional media. The latter described an attachment to the notion of a permanent physical presence, with the capacity to age, enabling a piece to generate and encapsulate its own history. She contrasts this emotional attachment to the physical with a desire for the freedom offered by the digital. However, while interactives can be seen conceptually as fleeting, performable works, this mirrors the time-based nature of viewer engagement with traditional artworks. Although digital works are perceived as having no physicality, they can also be seen as retaining their original power and form while paintings degrade and fade over time. Philosophically, they can be seen as encapsulating the history of the digital and of their own time just as a painting does. Practically, digital works cannot share the longevity of painting-as-commodity; the problems of archiving these artworks are crucial; notions of updating skills for specialist restorers, finding ways to preserve and make available digital works are being addressed by current research organisations[79]. This process will be accelerated by changes in attitude of traditional institutions - like the National Portrait Gallery's recently announced determination to include New Media works in its collection.[80]

The viewer comes to a work, whether painting or interactive computer work, with an existing network of associations, ideas and memories. Some of these will be medium specific; thus no artwork is ever viewed in self-contained isolation. Painting has traditionally been associated with the populist and Romantic notion of the long-served apprenticeship, the hard-won image, as described by Morphet (1984) implying not simply sustained effort but

> "the finding of a valid theme in this age without beliefs...and then dealing with it as deeply as possible"(Raymond Mason, quoted in Morphet, 1984:19).

The screen-based digital work is associated more with the instantaneity of the digital, with the notion of content-over-form that underpins an informational aesthetic. Yet this digital work is underpinned by a lengthy and hard-won process of calculation and programming, and the development of a combination of skills from disparate areas. Often this effort remains concentrated behind the

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[79] see page 16
[80] Nairne, S *The Portrait Now* London: National Portrait Gallery 2006

visible surface, but some of the characteristics associated with painting - the effortful mark, the apparent complexity, energy and emotional authenticity, can equally be used in computer-based works. Reviews of the recent Saatchi show offer hyperbolic accounts of the physicality of painting. McKenzie quotes Kemp on

> "the ravishing intensity of saturated pigments, and its paradoxical ability to insinuate the painter's impulses into the spectator's imagination... painting can conjure up a world of living beings, and tell moving stories" (McKenzie, 2005 no pagination)

Gingeras (2005) suggests the power of painting is in the way its sensual, tactile, atmospheric, mythological and ambiguous qualities interface with human memory, in a way that is both accessible and highly subjective. However, the computer monitor, with its backlit image and intense, adjustable colouration can similarly offer a ravishing intensity of saturation; and if it lacks the object-status of uniqueness it can still offer ambiguity, evocativeness, subtlety. Computer-based work can embody the human gesture, and attempt to compensate the lack of physical texture with another, highly evocative sense - hearing - and a sense of magic. Nor does computer-based art necessarily relinquish the concept of beauty, or of hard-won craft, as indicated by, for example, this review of the Whitney Biennial

"the so-called 'absence of beauty' at the Whitney (and there is plenty of beauty, actually) was not necessarily due to a presence of politics. In many of the works on view what was absent all too often was not only craft and precision but historical consciousness" (Rodenbeck & Scholz, 2006 no pagination)

Krauss describes a Postmedium Condition which suggests not so much that all barriers between media are down, but that old definitions are no longer useful (Krauss, 2000). She also offers the possibility that, while a return to painting by simple regression is not now possible, the medium might be reinvented. It might be rearticulated in the light of its own history and development, as differential, self-differing and layered (Krauss, 1997). It is necessary therefore to investigate the essential qualities of the medium, not only the theoretical and philosophical but also the visual, functional and sensual.

Digital Painting

Digital painting is dismissed by some as too easy and lacking the authority of the unique autographic mark. Faure Walker describes it as often predictable

and lacking in power, intensity and sensuality - with a blandness he calls a "lack of soul" (Faure Walker, 2006: 148). Part of this lack is the work's failure to reveal traces of its own history and process, its 'growing rings'[81].
Searle compares digital practice - clean and self-contained - with the old studio model of

> "a painter's midden, silted-up with the accumulation of oil paint and dust. Such studios are rare these days: now artists toil over the iMac, Photoshop software humming on the screen; there are no ghosts in their machines." [82]

Digital working often lacks support for the creative happy accident, when human volition is overtaken by medium. To create a powerful work on a computer the artist must, therefore, learn to allow the medium its own voice.

A significant number of painters work with the aid of digital technology; The Guardian, in, suggested that studio painting is now rare, replaced by artists using computers. In fact, many artists use digitally manipulated photo as a basis for conventional oil painting, such John Keane, whose recent *Guantanamerica* series uses the ambiguity in low-resolution downloaded and manipulated images to make equivocal, suggestive statements about Camp X-ray.[83] The computer here can be regarded as a tool, an aid like the camera obscura; but also as a means of setting up a dialogue between painting and technology.

Figure 21: John Keane: Guantanamerica Series

[81] this process is not automatic - the digital surface does not act as palimpsest. But the works have a capacity for controllable time-based shift which could be used self-reflexively to reveal process and change

[82] "It's About Time" Adrian Searle, reviewing Auerbach, September 11, 2001 http://arts.guardian.co.uk/critic/feature/0,1169,728542,00.html

[83] Flowers New York, November 2006. archived at www.flowerseast.com/Galleries_Releases.asp?exhibition=06FNYJKE

Other artists use the computer as a tool for generating limited edition prints, in hybrid works that combine digital printouts with paintings, such as Faure Walker and Wakeham (2000), who renders the print-outs translucent and layers them onto canvas to retain the saturation and depth, while adding texture and physicality. A good overview of artists working digitally in this way is provided by Raimes (2006). Interestingly, some of these print onto acetate, to be backlit like a photographic transparency,

> "to mimic the effect of a computer monitor" (Raimes, 2006: 187)

This suggests those artists appreciate the special qualities of the monitor, although they do not imagine using it for a static image. Very few artists are producing painting intended for on-screen viewing. This is in spite of the frequently disappointing comparison between the printout and the promise of the onscreen image. A notable exception to this is Jeremy Blake's 'time-based painting'; looped DVDs, often displayed framed on wall-mounted plasma screens which assert

> "a newfound fluidity between film and painting while continuing to blend idiosyncratic references to mainstream culture and high art"
> (Weil, 2005, no pagination)

Figure 22: Jeremy Blake: Time-Based Painting - from Sodium Fox

Blake establishes the potential of the painting to embrace the digital and the screen (or projector) but does not take it into the interactive. His work stands in the tradition of Artist's Film, in which one strand has been the exploration of Film as Painting-that-moves. This includes the use of drawn and painted marks directly onto film stock, from Arnaldo Ginna in 1908, through the works of Norman McLaren, Oskar Fischinger's visual music, and Riccardo Iacono. These

established a tradition of moving abstract, or semi-abstract images often linked to music or poetry, as a practice outside the film and animation studios which continues in web-cinema, and in the work of artists like Clauss and Blake. Digital Painting is often based on manipulation and re-modelling of photographic or 'sourced' materials - altering colour balances, quantising tonal variations, distorting and cloning shapes. A prejudice against these techniques as 'playing', (too easily accomplished) or 'theft', and against the characteristic marks of many digital tools as already clichéd has tinted the development of my practice. The available software tools provide an imitation of some traditional painting techniques such as wet-on-wet watercolour, and chalk or oil pastel textures. These, however, seem crude approximations, pale copies of another medium. The gestures, within a desktop painting system, are constricted and cramped; adjustments must be made to accommodate the shift in scale. The available tools aim in some measure to reproduce the feel, action and activity of painting, but without the mess. Mess however, by another name, represents the sensuality and tactile experiencing of materials, their feel, behaviour and smell. As a medium, computers both demand and produce cleanness: algorithmically constructed lines are clean and flat; colours are pure and without variation.

Experiments with tools in Adobe Photoshop offered textured marks, marks with multiple levels of translucency, and effective smudge-blend facilities which could be used intuitively but without simulating specific painting marks. These could be combined with different layer effects both within Photoshop itself and with ink blending effects in Director.[84]

The earliest attempts at consciously painting-with-a-computer followed my older, figurative practice in style and content. This seemed to fit rather badly with the new scale, using a language of marks from much larger physical gestures than were possible using the computer. The oil painting had real texture and relief, but the digital counterpart offered nothing to compensate for its flatness.

[84] These represent different Mathematical solutions for the combination of two colour values for the same pixel. While many are garish and clichéd, some offer the 'happy accident' and some offer high degrees of translucency without loss of colour saturation.

Figure 23: Comparison: Myshed - Digital Painting Experiment and Family - Oil Painting from Earlier Practice

The new working method offered some important new opportunities: to correct, change, and copy elements, to make subtle shifts in colour or placing of elements. Yet, while the oil painting's texture built up organically through changes and additions, the digital showed no record of its own progress. This type of image felt instinctively wrong. It simulated another medium without seeking to comment upon it; and the screen suggested comparisons with the photographic/ filmic which made its 'hand-made' interpretations seem inaccurate and misshapen. Crocket's suggestion seems relevant here, that

> "we need to find the progressive, imaginative and creative element in the virtual, and it does not hinge on realism" (Crocket 2005: no pagination)

This realisation led to an enquiry into the nature of computer mark-making. Whilst often regarded as a malleable medium, capable of imitating others, it has its own strengths, which might be used to develop a more effective and emotionally honest series of marks. The use of layers, which can be built up indefinitely and assigned various different degrees of translucency, is a key feature. However, random variations such as those produced by a dragged dry brush or the texture of paint mixed with sawdust do not occur. Marks must be deliberately made in an elaborate and artificial 'trompe l'oeil' texturing reminiscent of the paintings of Glenn Brown. Like them, a screen-based computer painting questions the relationship between real and reproduction, the form most familiar to the majority of viewers. The computer-based interactive painting is experienced identically whether through the original or the cloned reproduction.

Homogeneity is another key visual element intrinsic to the computer. Drawn, collaged and photographic elements; moving and static elements; originals and their modified alterations can all be included on an equal and formally homogenous basis, indistinguishable by visual quality. Whilst this removes the traces of the image's growth, it can also be very powerful, allowing textures to be treated as elements, and assisting with the process of animation.

On-Screen Painting

Object-oriented programming requires interactive systems be broken down into isolated objects which can be controlled and manipulated. Like a painting, however, the image needed to function not only at a level of detail, but as a single, homogenous image. This required experiments with Photoshop and Director to find easy ways to divide an essentially singular image into meaningful components and how, economically, to animate a richly textured image. A more computer-efficient animation of images can be performed through programming, through the dynamic creation, distortion and movement of shapes and lines. This is not possible with 'painted' images, where colours and textures blend into and overlap one another.

The prevailing aesthetics for screen-based media owe more to Film or to Games than to the painterly. A small number of artists whose on-screen works have been compared to Painting seem to retain an emphasis on the filmic and textual. An examination of past winners at Seoul[85] shows a mixture of text-, photo- and video-based interactive works, and flat-colour animation. CrudeOils (2005) have recreated the *Mona Lisa* and Monet's *Bar at the Folies Bergère*, as interactives, using video and driven by computer technology. These owe something to Cindy Sherman's photographic reconstructions of Great Masters and a cinematographic, rather than a painterly, aesthetic. They attempt to include the viewer in the work and narrative as a way of questioning the roles of subject, object and voyeur.

Newton (2005), in a Masters study, created a wall-hung interactive image which responded to viewer movements to produce changes in a second image. This used lenticular technology to look at ways of making explicit the individualised

[85] www.senef.net

experience of the viewer, offering different simultaneous views to different viewers. The problem of integrating objects into a coherent image visually, while they are treated (and animated) by the software as separate elements, is simplified by the use of a flat, hard-edged style. The chosen aesthetic resembles that of an animated cartoon.

Clauss is a painter whose progress from Painting to creating interactive works in Macromedia Director mirrors my own. His interactive animations owe something to a film aesthetic, employing photographic animations, stark and minimalist lighting, and film artefacts of noise and scratches. These works are distributed via the internet, but interestingly, he classes himself as a painter. He describes his work as operating

> "between experimental movie and painting. My aspiration...is to experiment with the space between video, interactivity and painting" (Clauss, 2002 no pagination)

The late discovery of Clauss' work was exciting as it suggested someone working in a specific area bridging two contexts.

Figure 24: Nicolas Clauss: Sorcière

Interactive art and aspects of New Media have been described as a new Cinema (Manovich, 2003, Rieser, 2002) a new Theatre (Laurel, 1993, Davenport et al, 2000), a new TV or Book (Bolter & Gromala, 2003) but none of the theorists describes it as a new form of Painting. The blurring of boundaries between disciplines that informs New Media practice does not appear to extend that far. Yet an approach towards interactive art from the direction of painting

would enable some bypassing of the emerging rules and accepted formalisms of the New Media canon - and allow the work to develop in its own direction, as Interactive Painting. Malik suggests that Painting is now liberated to share the directions and concerns of all contemporary art.

> "painting is now not post-dead or undead or ghostly...but rather robust...rich with the unending diversity of what painting...can be and can do"(Malik, 2003:13)

Having been rendered foreign by the shifts in culture around it, it has regained the power to surprise and make strange. In this context, an attempt to reinvent painting as interactive is very appropriate, and a logical extension of the development of my own practice to date. An important part of this reinvention is the notion of truth to materials, to medium. Digitally generated works belong on screen, with the power of luminescence, of infinite layering, and of viewer-controlled movement and change.

Colliding Aesthetics and Expectations

Interactivity permits one work to be many - not only in the sense of having more than one visible state or narrative path, but in the tension between cause and effect, between expectation and response. This provides a moment of imbalance, forcing a choice or an interpretation by the viewer. Rokeby's *Giver of Names*[86] uses the tension between the viewer's pre-conception of the chosen object and the computer's response to, and classification of it to entice the viewer into thought and exploration (Rokeby, 2003). The call to understand this confounding of expectation is made explicit by the time-basis of the work, which suggests a human-logical thought process occurring within the computer.

While the screen interface is the dominant cultural form, interactive works whose interfaces diverge from the languages of the filmic, the multimedia and the sampled bring a collision of expectation. This demands, in an explicit way, exploration and questioning. The later works in this study attempt to use this collision creatively. *My World* was an attempt to develop an intuitive and playful means of controlling an interface, visually related to children's drawings. It explored the computer as a graphic medium, using marks and tools uncovered during experiments on the software training course.

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[86] see page 44

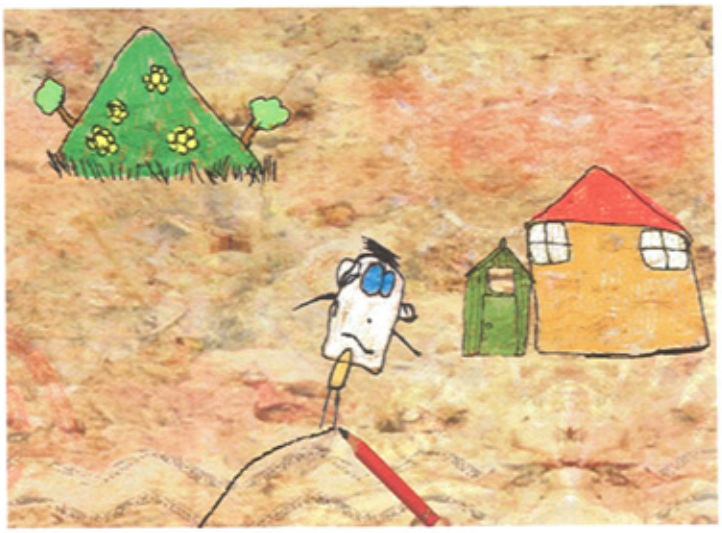

Figure 25: My World: Taking the Avatar for a Walk

My World attempts to adapt Interactive Fiction's model, which leaves gaps in the representation for the viewer to fill from her own imagination. It offers both emotional involvement and an imperative; the structure is a Navigable Space, an open-ended playground, but also offers a goal - one linear possibility of closure. Pinhanez et al (2000) found that interactive environments were perceived as highly responsive, engaging and interactive, in spite of offering limited control. This was fostered by the system's responding to small gestures or minor decisions, and by natural, kinaesthetically satisfying physical gestures. Too much choice, they found, actually hampered the participants' engagement.

My World therefore offers limited options for navigation and choice, via a simple interface. The piece used the idea of Klee's taking a line for a walk - using a pencil to draw a line, which the character could then walk along, simultaneously drawing a map of the user-avatar's exploration. The avatar's actions alter depending on which other character (if any) is in the same location. This piece has a dramaturgy and a personaliseable narrative, and uses the gesture of drawing to generate paths along which the avatar walks. Thus it does not simulate reality, but allows the viewer to identify with the blue-eyed figure, who exhibits some personality through quirky movement and attitude, in a way that was not possible with TVHouse. I felt it to be very successful in terms of the engagement and the unfolding of narrative through the interaction. Early feedback suggested viewers took for granted that it was 'about' something or

had a narrative intention; that it was "powerful" and "revealing"[87] - suggesting emotional connections were made.

Figure 26: My World: Details

My World explores relationships, and the mechanism of the interactivity is tied to this narrative content. So, the viewer's reflection on the interactivity: "Why do I spend so much time in the shed?"[88] (an expression of frustration at not understanding the navigation system) can become a contemplation of why a person might need solitude, or become trapped. This piece was therefore used to obtain viewer feedback on a larger scale.

Many viewers did look for a meaning and anthropomorphised the figure in *My World*. There was an assumption that there was a narrative - story or journey - concerning life decisions and priorities and their implications; a quest to find oneself, one's place in the world, or happiness and love. The blue-eyed character ('me') was variously presumed to be the author, the protagonist or a sympathetic *non*-hero; the viewer, her surrogate or a representation of the other -"not-me". The other (identical but non-controllable) blue-eyed character was variously presumed to be a representative of the self (the non-hero's quest to find himself, or two aspects of the same person), a soul-mate, or a narcissistic love-partner - "I love you cos you look like me, I get that!" One viewer commented that 'me' uses friends for his own pleasure and drops them easily, only content with his own company. The work instigated conversation and considerable laughter. Those viewers who engaged with the piece together constructed narratives and commentaries along the way. *My World* also prompted some degree of introspection - so that comments ranged from

[87] viewer quotes from informal feedback sessions Newcastle, October 2005
[88] viewer heard asking himself this question out loud, testing UNN October 2005

"recognising that I have a problem-solving mind" to asking "Do we choose people in our lives over other people?"

Viewers found the work engaging and playful, (one viewer described feeling "like a kid...great to feel that at 42") and enjoyed the elements of surprise, of discovery and problem-solving. This work consciously makes use of play, offering a wider range of outcomes and animations in response to the viewer's decisions. Causing the avatar to walk to the intended destination encourages viewers to perceive not choices or click-to-select, but a landscape they can explore. It also introduces a durational or time-based dimension to the interaction itself, encouraging viewers to invest in their decisions.

Few viewers commented on the visual aspects; this may reflect viewer's comfort levels with the vocabularies of action and of aesthetics, but will also be affected by their presumed reasons for eliciting their responses. Several mentioned the conceptual aspects; the "happy ending", the simplicity and the *lack* of clarity which made exploration worthwhile. Viewer comments suggested tensions in the work between a "sense of loss or sadness and hopeful all at the same time" and between "playful and light-hearted" and "lonely". The combination of action, narrative and accessible imagery seems to have worked well and the cartoon aesthetic contributed to an assumption of narrative; a story or point.

Problems with engagement centred mainly on usability issues. The viewer's model of the world and how it behaves was not always supported by the actual model. They did not realise that different things would happen if a location was visited with different companions, nor did they explore as widely as I had anticipated. They tended to get stuck with a companion, ("This dog's starting to piss me off now"; "the pink lady - I couldn't get rid of her") and not apply a real-world model in which to leave the dog field, you might go through the gate, or to prevent two children fighting, you might separate them physically. Viewers were frustrated by such limitations as the pencil only drawing a line for one character, or being unable to drag the character around the overview map; by not being able to use the work as they wanted. I was able to make use of this feedback to clarify and improve the interface, although subsequent viewers

were still puzzled by the 'reset' factor - the work's return to the start-point if unused so that subsequent viewers can begin at the beginning. This problem could easily be circumvented by making a piece with no beginning, or a system which always returned to resting state after each viewer action. However, this is a highly limiting model. I decided, rather, to look for a very simple interaction mechanism, returning to basics.

Love explored a similar idea to the earlier *What?*; the problematic communication of the idea of Love, and the difficulties of predicting a response. It used the same concrete diagram model, and is essentially a click-to-choose information aesthetic model, but within a richer and more ambiguous visual environment. It explored a different method of durational interaction, one more graceful and less comic through a gradual fade on and out.

Figure 27: Love: Showing One Set of Links

This was partly a response to the challenge of animating a textured image whilst retaining its 'painted' surface quality, and partly informed by film techniques. Love represented a transition from an 'object-based' model (of works having controllable objects - a God, an avatar - or having one key object around which the others fit, as in *World*) to a consideration of the picture plane as a whole, shifting or behaving image. In spite of this, *Love* seemed very static; it had a sensuousness that was rich, emotive and tactile, but lacked the pace that the subject matter required. The maintenance of a rich, textured and holistic visual quality tends to make alteration or animation exponentially more difficult than with a simpler, more abstract formalism. I decided to try to free this by

approaching *House of the Spirits* as I would a traditional painting, without a pre-plan, rather as a response to an intense visual stimulus. Clauss described a similar working method - subconscious, not pre-planned, open to happy accidents, which communicates with the viewer's subconscious - as a painterly methodology in opposition to the self-consciously clever.

> "I now do works nearly like I used to paint, without a plan. Most of the time it's a dialogue with the canvas". (Clauss, 2006, no pagination)

This method enabled a more emotive, more dynamic and developmental process - but is at odds with the Computing model and makes programming more complex.

Figure 28: House of the Spirits

The narrative of *House of the Spirits* is not precise or time-based, but rather makes connections between ideas and aspects of the image to convey an overall idea based on a celebration of the circularity of life. It needs to be explored in an open-ended and inquisitive way.

This piece was tried out in a number of versions, (interactive and non-interactive, with and without sound) but following a personal undertaking not to endlessly defer completion, a single final version was created. This incorporated a play area, only accessible from certain points in the work: a musical section where the viewer controls 'instruments' (including the pecking chicken, the clapping skeleton). This structural decision 'rewards' the viewer who chooses to engage for longer. It actively encourages a longer engagement through the explicit addition of stages, which permit different sorts of behaviour as well as

yielding different meanings. This play area functions as a toy or instrument, open-ended and creative. Other aspects of this piece require specific viewer action (free the flying heart by cutting its tether with the scissors) before the animation, the narrative and the action can progress. Here, the work acts as a puzzle, in which the meaning or narrative is tied to the interaction through a simple simulation, representing an interpretive interaction. The puzzle aspect is also explored through hidden controls - the image is seen as a whole, without discreet 'clickable' objects. These can only be identified by cursor, by exploring the whole image with the hand and mouse. The combination of the two styles gives the work pace.

The decision to have occasional sound in this piece would work well in an immersive gallery situation, where it would be unexpected. However in order to show this piece in a mixed show, without sound insulation, it needed to be installed with headphones. This necessitated a more continuous sound, to prevent the viewer assuming some fault, and removing the headphones. This problem became the happy accident: it gave the work another layer, and permitted the use of realistic and musical sounds to give the piece pace, and depth. Interactivity - a simple rollover - changed the 'resting state' sound, providing an additional incentive to engage and clarified the location of control areas on the screen. Visually, this work successfully combined photographic source material with sampled texture, reworked video and painted marks; but the real success of the piece was in the sound.

Interactive Stained Glass

In spite of the success of *House of the Spirits*, I felt the small scale and the limited gestural capacity of the Wacom pen[89] as a painting device did not permit the same kind of painterly approaches as actual paint; nor would it be appropriate to simply imitate that medium. The computer monitor offers lush, saturated colour and a layering of transparencies offering visual depth. Working on-screen is essentially drawing with light, and light can draw with great sensitivity in the varying focus of sunlight through leaves, the hallucinatory wavering of intense heat, and the distortions of an imperfect lens. This

[89] a free pointing device, similar in size and shape to a ballpoint pen, used with a drawing tablet in place of a mouse.

realisation sparked an investigation of the visual qualities of stained glass, a medium which relies on intensely coloured light and imperfect (rippled, uneven, bubbled) or textured lenses for much of its powerful effect. The obvious association of stained glass with religion and narrative suggests its suitability to my own work. Gilbert and George use the emotive and religious associations of a stained glass aesthetic in juxtaposition with the erotic or profane in their 'photo-pieces'. The formalisms of stained glass invest the content with importance and offer a critique. (Duff, 2004)

Study visits were made to cathedrals in Newcastle and in London, and to the National Glass Centre at Sunderland. These highlighted the complexity of the medium; having two surfaces which can be seen both together and separately, and having textures on both surfaces and inside. The colour is not flat but washy, or faintly marbled, and a comparison here can be made with Matisse's paper-cuts[90], which offset the gentle internal texture and shading of the colour with the starkly cut edges.

In Kate Owens' *Gates of Ades*[91], an abstracted stained glass effect is constructed from plastic drink bottles, the ends of which resemble huge jewels. This enormous structure was both immersive and contemplative, and had a sensuous beauty quite disconnected from its everyday materials. The juxtaposition of these materials (actual soft drinks full of additives) with this 'pure' beauty gave it layers of meaning. These inspiring visits led to a series of experiments with scanned glass, texture sampling from photographs, and drawn and painted effects. These sought to obtain the best luminosity and intensity, and to preserve texture without losing luminosity.

Window explores a similar theme to both *Skeletoon* and *House of the Spirits*. The interactivity allows the user to control the flow of the narrative, so as to permit contemplation of images; and to emphasise the simple dependencies from different perspectives. This piece also explores the idea of offering the viewer intuitive and non-didactic feedback - integral to the image -as to how the piece behaves.

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[90] Exhibited at the Northumbria University Gallery, "Drawing with Scissors" Sept 2006
[91] exhibited as part of "Trip the Light Fantastic" Feb-April 2006 at National Glass Centre

Figure 29: Window

This incorporates a large 'count-down' image which the viewer may guess indicates some impending change and the need for repeated action, and a snail image which when rolled over causes the speed of the animation to slow. Successful interactive works must balance the need for the viewer to understand what she can or should do, with the desire to keep the image 'pure' – not contextualised with menus, instructions or knobs and levers unless these are part of the concept itself. For *Window*, the desired impression was that of an actual window, but one which changed when touched – as if 'magic'. By keeping the controls minimal and following familiar computing conventions (finger and hourglass cursors, rollover feedback via animation on those objects which act as controls), and by incorporating the iconic elements of the controls into the image itself, it was possible to make a homogenous piece with simple and unobtrusive controls. *Window* also used the model of creative interaction, through the painting hand, and of viewer-controlled animation. It may be seen as offering interpretation, as the viewer clicks on - for example - the fish image to see the work from a 'fish perspective'.

Window was constructed using both vector (to obtain smooth lines and shapes) and bitmap (for texture and layering). It did not allow the freedom of approach to process that *House of the Spirits* did, but was moving towards finding a voice for Interactive Painting. This would amplify the monitor's visual capabilities rather than fighting them and employ working method which allowed some

freedom but some control: an Art which made some concession to the need for Design. Pleased with success of the visual style, I returned to *DIY Religion* to create a new piece, *Faith*, from that original idea. The resulting textures and richness of detail encourage a more lengthy engagement. The visual feedback is much more subtle and suggestive of reality; for example, the lamp which lights to indicate the presence of a god gives off a graduated coloured light which alters the various colours of the background.

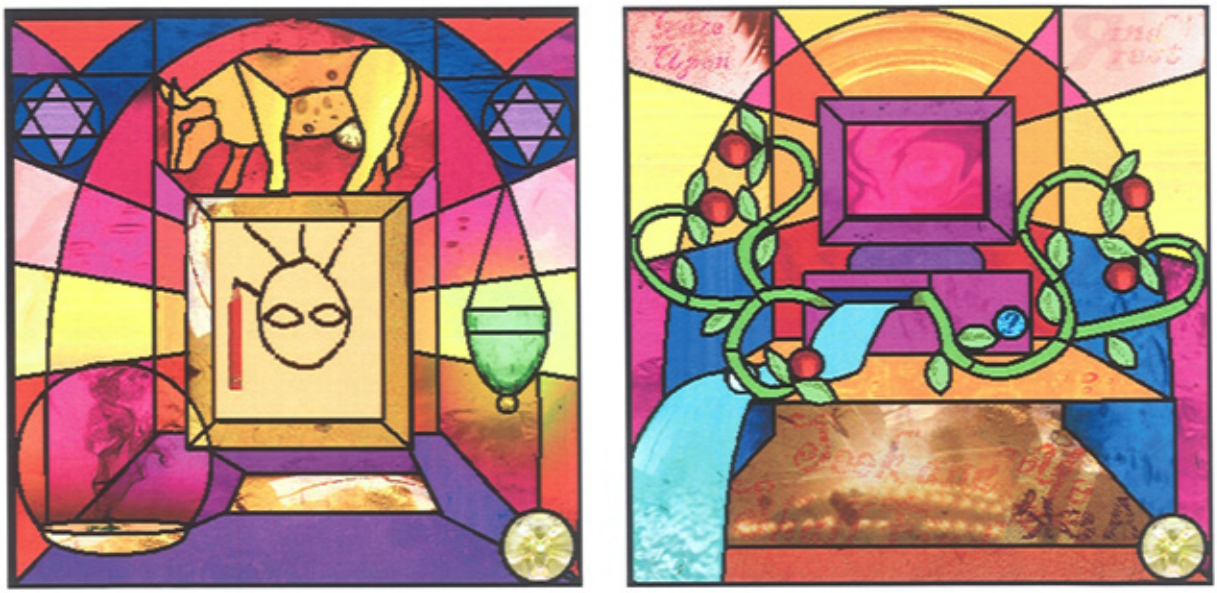

Figure 30: Faith

The interactions require the viewer to perform some task – such as lighting candles or controlling chanting, symbolic of the notion of sacrifice or offering – in order to maintain the integrity of the object. This model is similar to that used in Max Dean & Kristan Horton's *Be Me* - an artist confessional, in which the viewer must speak continuously into a microphone in order to advance, and control the facial expressions in the video of the artist speaking. This draws emotional engagement by requiring the viewer to give something of herself in order to receive the artist's own personal revelations (Dean, 2004). This simple interaction is not a conversation but a means of making the viewer invest time and energy, making explicit the model of spectator as participant. In another layer of meaning, *Be Me* refers to a failure of communication, in which one actor controls the other. Between the emotional engagement and the revelation of the fiction of communication, the viewer may be encouraged to move from immersion in the experience to reflection upon its wider meanings. *Faith* offers creative interaction through the drawing frame, play through the musical

instrument model of the chanting mouths, and an overall Navigable Space model. It offers fast-paced action, including the suggestion of game-style imperatives or goals, in individual temples, but spaces for contemplation, rest, soothing sounds in the 'central hall' and the 'hillside' areas, to encourage the viewer to move between immersion and reflection.

Even at a small scale, interactivity can be used to reintroduce the notion of effort, representing a commitment to engage and associated with rewarding feedback and a sense of achievement. Ryan (2001) suggests physical interactivity as a way to make the viewer work for the image, as a way of cooling down a hot medium (one which is highly immersive and rich, leaving less to be imagined by the viewer). Unlike the frenzied and noisy activity of *DIY Religion*, *Faith* simplifies the interaction to something slower and calmer, accompanied by soothing and seductive sounds. The action disrupts the contemplative immersion but gently, allowing the viewer to experience both the immersion and the activity together, like two layers of the same image. The actions are symbolic, but represented in a way that is intuitive so the viewer would not need instructions or onscreen text.

Window and *Faith* are therefore the most successful of the pieces I have made so far; the most true to my own artistic practice, and representing a fairly simple and low-tech form of interactivity which is truly integrated. The interactivity reflects upon the meaning of the pieces, and as such is essential in driving forward the small narratives. The hand (in *Window*) must paint and then teach the child's hand to paint, by example. This simplified symbolic action allows the child to learn and grow up, allowing the cycle of life and death to complete itself. The viewer must worship the false gods through symbolic actions in order to maintain their existence. The contemplative nature of the piece should then lead the viewer to a refection on this relationship of supply and demand. The passion in these works comes for myself as the artist, from the richness and beauty of the colours and textures; and the humanity of the quirky humour. However there is still a lack of human gesture.

In Summer 2006, I exhibited several works as part of the Northumbria MA degree show. This provided an opportunity to experiment with the 'framing' of

the works. I set up the space as a blacked-out room with comfortable chairs and benches covered in matching fabric, and a table-lamp, to create an intimate ambience suitable for contemplation and immersion. While paintings in a gallery are usually experienced standing up, walking round, all the works shown here were experienced sitting down, to encourage relaxation and a long stay.

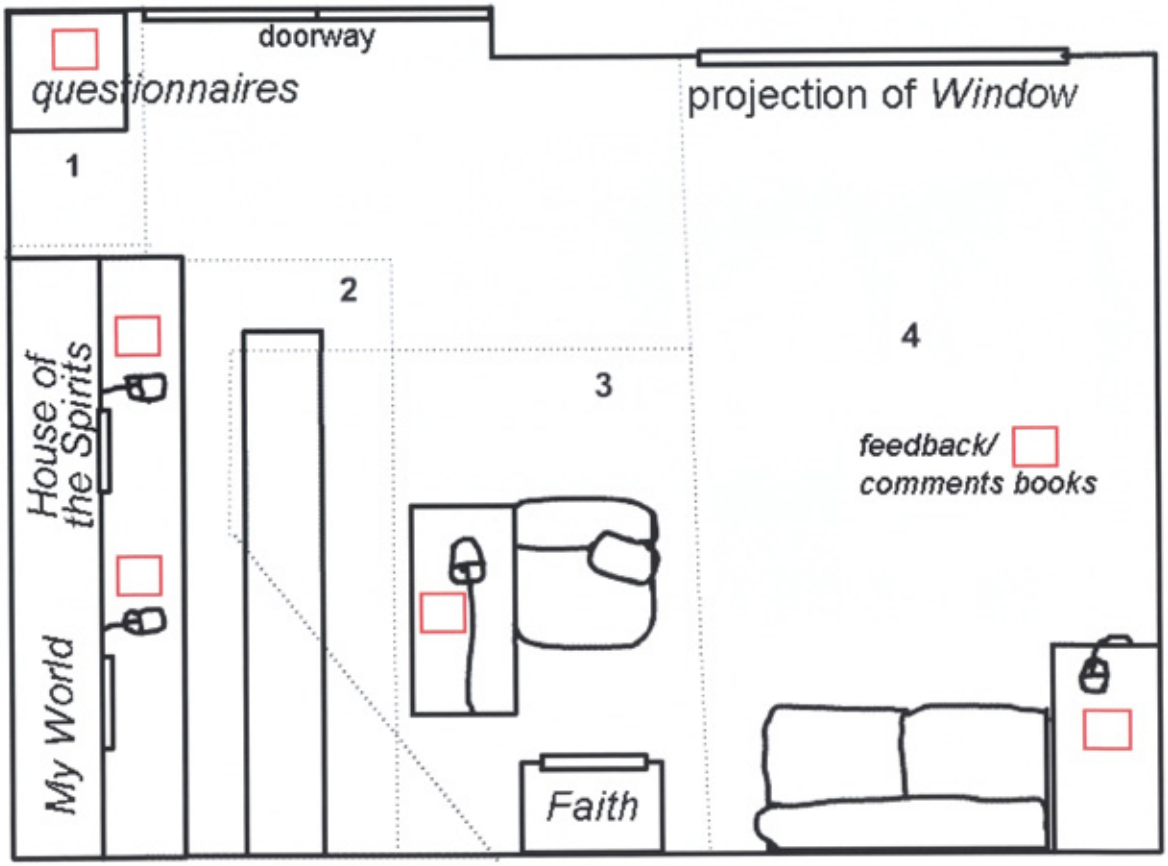

Figure 31: MA Show Layout

Window was shown projected onto a wall in front of a sofa; the darkness and contrasting brightness of the projection and saturated light contributed to the immersion, and the sense of having created a separate world. The insistence on domestic scale for the works in this study has limitations. Projection alters them, offering a more spectacular, less intimate kind of immersion and allows for the re-introduction of the affective through a scale and intensity that is capable of overwhelming the viewer and shutting out other concerns.

Faith, My World and *House of the Spirits* were shown on monitors boxed in behind false walls. Partly for security, this also isolated the image from the box and the technology, suggesting an image on a wall rather than a computer application on a workaday object. Headphones were used to separate sounds

from two pieces and avoid sound spill; this was found to contribute to the sense of intimacy and immersion. Seeing *Window* on this scale suggested further experimentation with scale and immersive sound. This exhibition also showed the interface of *My World* continuing to be a problem – viewers not reading or not understanding instructions, intuitive interface elements turning out not to be intuitive at all. A series of changes was made to the piece to improve this, but the simpler works (with rollover and point-and-click interaction) proved more popular in spite of the relative slowness and contemplative nature of the exhibit as a whole.

Faith was variously interpreted by viewers as being both relaxed and shocking; both peaceful and ominous, which suggested the tensions in the piece were well balanced. This was underlined by two viewers' written comments "Bloody hell, what a shock!" and "I could have played for hours". Similar responses to *Window* described it as mesmerising, beautiful but shocking - "a painting that could make you jump". Viewers were puzzled, identifying *Window* as cryptic - but this did not seem to prevent it's being identified as "great fun". Indeed this might contribute to its appeal - "Feel as if I'm part of some Tarot". The interactive element was felt to be enticing. One viewer commented, "I love it. My 15-year old, who loves nothing, would probably love it."

House of the Spirits was similarly described as both peaceful and threatening; as elemental, mystic and exciting; and as confusing, puzzling but fun. Again viewers seem to have found the surprise elements of behaviour interesting, adding the dimension of anticipation. Some frustrations were expressed at the interface model ("I'm knocking but I can't get in, which is getting on my nerves") but here, as with *My World*, these are expressed in real-world terms which indicates the viewer has formed some emotional engagement rather than simply an intellectual one. Overall, viewers found the work both playful and contemplative, and to some extent emotional, seeing it variously as story, toy, experience, test and in one case - one I aim to pursue - "Magic Stained Glass".

Framing

The exhibition opportunity suggested the possibilities of using other kinds of projection, and placing more emphasis on the 'framing'. I had originally

imagined the works in wall-mounted flat screens, but use could be made of textured screens constructed of paper or fabric and framed. This would retain a physical barrier between viewer and work, but a softer and more human one than the glass, offering a more visually rich or striated surface. Experiments were made in direct- and back-projection onto different surfaces. Some of these were translucent, suggesting the possibility of a secondary de-focused image something like the light falling through an actual stained glass window. This proved difficult to achieve; of the various materials tried the most effective were cotton voile (which failed to diffuse the glare for a viewer looking directly at the image), white crepe paper, and semi-opaque white shower curtain. Experiments were also made using a flexible screen; something light, even ethereal that might move in a breeze. This would soften and mitigate, rather than simply hiding, the harsh square solidity of the monitor. Luc Courchesne's *Portrait*[92] series - interactive 'talking heads' with whom the viewer can converse via text - uses projection onto glass as a way of separating the image from the bulky monitor, creating a ghostly image which plays with presence, absence and suggestions of magic. These disembodied faces sudden appearance afforded more presence than the stronger boxed-in screen image.

Back-projection onto varnished tissue offered a good solution, but the normal mirroring function of the projector image cannot be used. Reversing the image would reverse the relationship between mouse and cursor movement; making interaction impossible. Instead, the work would need to be re-made with all the images visually reversed. The more texture the screen contains, the harder it is to see the cursor's position or changing shape. A larger cursor object or 'tool' would need to be used and the interaction would have to be simpler, more gestural and poetic to fit a more blurred and suggestive image. Clearly, these effects need to be built-in and cannot be simply added to an existing work.

Projection frees the image, both conceptually and visually - from the glass wall and the severe and machinic qualities of the monitor. It allows for non-rectangular images. The rectangular picture frame, rooted in both the traditional aesthetics of the golden section, and the practical aspects of working with physical materials is surprisingly tenacious as a model. Composing for other

[92] can be seen online athttp://wwwe.din.umontreal.ca/courchesne/portrait.html

shapes is a challenge in itself. This understanding informed the reworking of the early *World* pieces, and the creation of a hexagonal work Colliderscope. This was conceived of as a toy, open-ended and pleasurable. It can be engaged with very rapidly or used in a longer engagement to create new images. However the toy also has a meaning - whatever the viewer creates is repeated, violence creating more violence; beauty creating more beauty. Whatever the viewer creates (even if she chooses to write obscenities) becomes symmetrical, but this symmetry is fleeting; it requires constant effort to maintain.

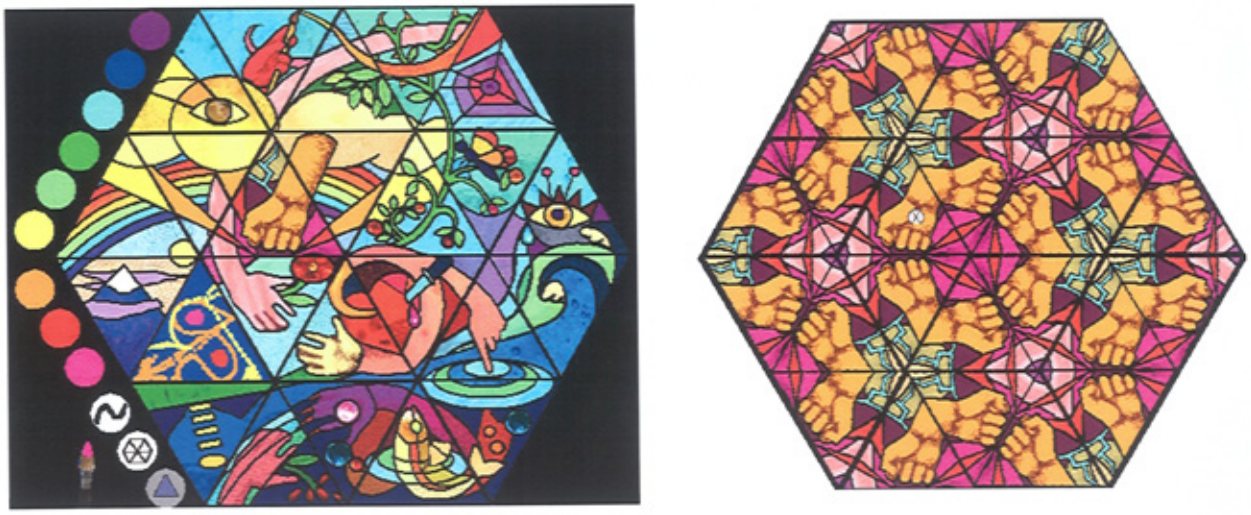

Figure 32: Colliderscope

The practicalities of interacting at length and concentratedly with something large and projected on a wall seemed awkward. The two different interaction styles did not marry well; while the simple click-and-hold pattern generation was rapid and easily understood, the creative interaction of drawing was more problematic, requiring large numbers of control objects with clear labelling. These controls are not fully reconciled to the notion of the image as an isolated projected form.

Figure 33: Colliderscope: Viewer Drawing

A possible solution to this might involve separating the control objects onto a second (monitor-based) screen representing a control panel. This, however, would distract the viewer from the image itself, separating the image from its behaviours and damaging the fragile tension between immersion and activity. The viewer's attention needs to be focused on the fleeting nature of the symmetry; and maintaining the pattern requires a sustained - if small - effort. This work was engaging, allowing the viewer real creative input and opportunity for play. However, the notion of choosing to create a pattern of good or bad, violence or peace is subsumed by the elements of the drawing book. This piece offers two levels of playing - the immediate, thoughtless, click-it-and-see; and the creative play of drawing and constructing new patterns. It demonstrates the opposition between flow - immersion in playful activity, and immersion in the visual and communicative; the difficulty of reflecting whilst playing, and the need to balance the extent and difficulty - or creativity - of the interactivity to prevent the other aspects of the work becoming swamped by it.

Layers

Stained glass typically functions as both object and window, both seen and seen through. Its unique quality of light comes from layers; behind is not a void but a shifting sky, moving figures, a play of light and shadow. A VJ night[93], offering a profusion of overlaid ambient images in sharp and saturated colour, suggested a greater use of layers in the work. A direct- and a different back-projected image could be combined through two linked systems in one work. A work could be constructed with multiple layers, moving layers behind still ones to add metaphorical and visual depth and add subtle narratives without diluting the visual intensity. These layers could respond differently to interactivity.

The viewer looks with the symbolic mechanism of the mouse (reflected in an eye cursor). She activates the painting by choosing to look, and the layers are uncovered slowly, gracefully; some fade, others dissolve where the eye falls, revealing layer beneath in a trace of the viewer's movements. If the viewer looks away - ceases to move the mouse - the cursor changes to a closed eye (an attempt to make the interface here natural and transparent) and the image fades away, so that a constant physical effort is required. The idea of the gaze

[93] Star and Shadow, Newcastle, September 2006

as a nurturing force, rather than a destructive one - that looking at something will cause it to grow or flourish, (as opposed to the Eastern idea that the eye dirties the work by looking upon it) was suggested by Grau (2005). The work offers a visible model of cognitive interaction, and a pleasurable kinaesthetic interaction as the eye tracks just in the wake of the movement of the hand.

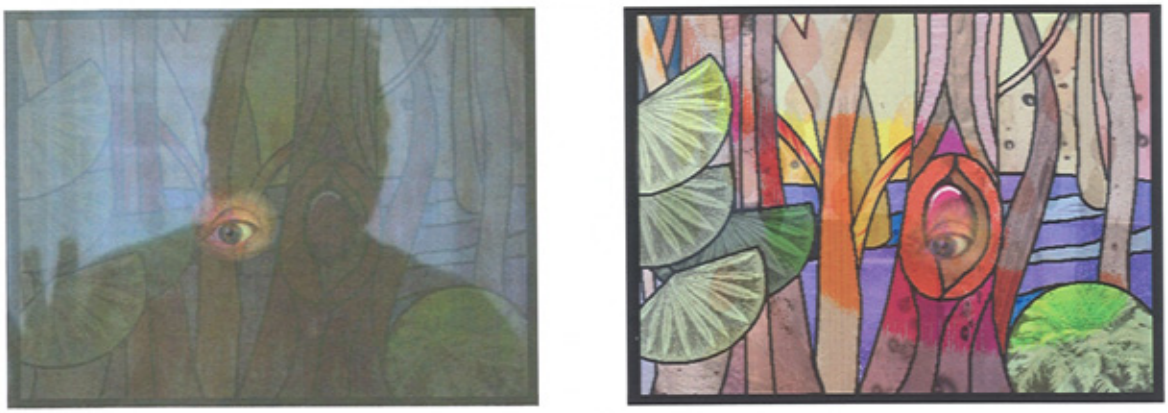

Figure 34: Trees

Although the technology exists to track eye movements, the symbolic mouse-eye offers the viewer a conscious control, and differentiates between a fleeting or careless glance, and a concentrated looking. A touchscreen could be used here to provide a tactile and very direct connection, but I wanted a more fragile linkage that might encourage the viewer to a gentle action, discourage the possibility of 'guerrilla' interaction and random, high-speed clicking. More pragmatically, a solution was needed that considered the needs of 'second-layer' viewers, preventing interacting viewers from blocking their engagement. It is necessary to balance the need for intimacy with the practicalities of distance.

The effort required to uncover the image seemed disproportionate to the rewards, and they seemed overly self-referential, lacking an affective layer in favour of a more intellectual engagement with the image-as-image. This underlined a question of the extent to which an unemotional subject could provoke an emotional response. Polaine has suggested that

> "engaging interactivity is usually simple, utilising one clear idea and is rarely able to carry complex meaning" (Polaine, 2005:3)

and this now seems to point to the tension between an emotive engagement and the need for intellectualisation. I felt the idea could be expanded into a more emotive dimension, using the revealing of layers to uncover secrets and

the need for movement as a means of achieving a metaphorical balance between states.

Where larger, kinaesthetic interactive works allow for evocative gesture, smaller-scale works can achieve an intimacy of small gestures. Movement dynamics can evoke a sense of urgency or panic; or be mesmeric and soothing. Wright (2002) argues that all perception is kinaesthetically motivated, so that visual and aural perception is driven and affected by movement. Both Jordan (2002) and Manovich (2001) equate an active mental engagement with an active physical engagement, citing physical interactivity as a means of overcoming passivity and unquestioning consumption. Some artists have experimented with ways to reintroduce physical effort to the digital, to make a more direct emotional and tactile connection, and demonstrate viewer commitment - Brucker-Cohen's *Crank the Web*[94] is an internet browser which buffers the web page and loads it only according to the speed with which the viewer turns a physical crank attached to the computer. Thus it requires a constant human effort, and the more energy expended, the faster information can be accessed. More fundamentally, Polaine (2005) and Corby (2000) describe the simple joy of physical movement linked to bodily sensation and emotion.

Physical interactivity enables the viewer to bring into play kinaesthetic memory, which can be significant even in fine gradations of movement and position (such as fingering positions on the violin). Clauss' *Nocturne*[95] makes use of viewer (mouse) gesture to create dynamic patterns on screen.

Figure 35: Nicolas Clauss: Nocturne

[94] presented at User Mode Emotion Conference, Tate, May 2003
[95] http://www.flyingpuppet.com/nocturne

Here the kinaesthetic and affective gesture of the natural interface has been scaled down to allow small but flowing movements which drive forward a narrative or journey, leaving a trace which balances free play with narrative unfolding. The mouse-hand gestures themselves can be seen as sensual.

The idea and basic programming of *Trees* was used to create *Passion*, which explored a more emotionally rich area - that of passion as both creative and destructive - and attempted to balance the formality of stained glass with a more gestural and painted mark. In this, it could be related to Tracy Holland's backlit transparencies which, although rooted in photography are rich and complex, using transparency to layer images and run colours together; they offer an emotive and sensual form in a translation of photographic conventions. The backlighting gives these images an intense colour with subtle variations in texture.

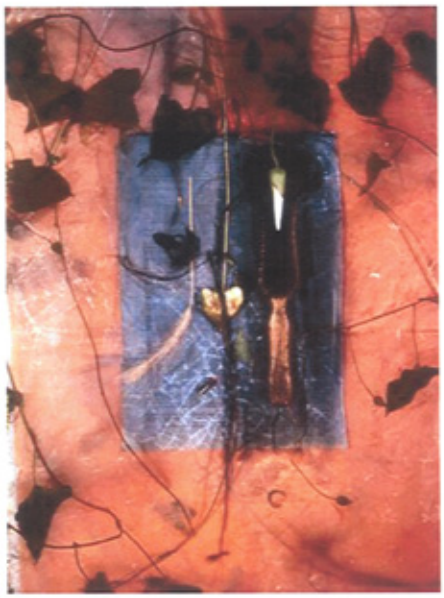

Figure 36: Tracey Holland, 12 Keys

Passion functions as both Navigable Space and physical representation of the gaze. It offers kinaesthetic interaction, to navigate through the picture plane and to see through layers of imagery by 'clearing' or 'sweeping' motions, symbolised by a cursor resembling a hand with a cleaning cloth. It is open ended, although its behaviour changes at a key point when the 'bottom layer' is reached. *Passion* it uses sound to demonstrate balance - between inner and outer (the latter represented by music), and between the symbolic areas of hot-agitated (fire) cold-calm (water) and barren (wind). The viewer is invited to personalise the image by choosing her own balance of sound, her own degree of heat/

cold/emptiness. This choice can be conceptualised as exploration, and as 'choosing a favourite place to sit' rather than a machinic choice/navigation; the image is not permanently changed. It immerses the viewer in colour, sounds and a mesmeric slow motion suggestive of waves on the sea. The suggestion is reinforced by real sampled sounds of wave. The visual and aural effects echo each other, punctuated by the sudden incursion of incidental sound and image driven by unseen control objects.

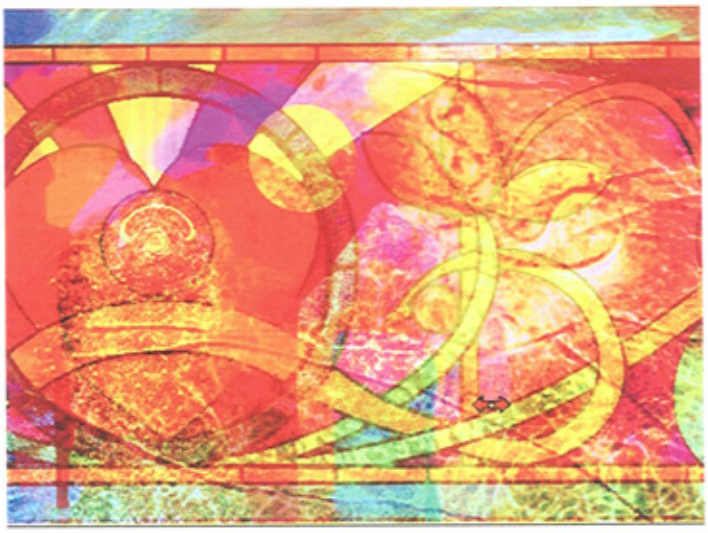

Figure 37: Passion

This work is more abstract than earlier works, but that abstraction is supported by real-world sounds. Although more complex it was more successful that *Trees* and represents perhaps the most complex visual texture so far achieved.

Figure 38: Passion - Pop-up

This model of exploration and discovery worked well. The viewer does not make an informed choice, based on a task-driven computing paradigm, but explores

possibilities in a safe environment. The relationship between viewer action and response is not random, but consistent, following simple rules which can be deduced. *Heart* was created to expand that interaction whilst retaining the simplicity. The viewer follows a path with the mouse, with each different path revealing different experiences and sights. Moving off the path would make it disappear; completing the journey would bring the viewer to a new image. The object of exploration is the human heart, and the links - representative of love-relationships - require some effort to follow. The viewer must determine how different sections can be navigated, such that the successful realisation of, or escape from, a relationship becomes a puzzle to be solved. The interaction can therefore be seen as both elemental, and auto-pedagogic.

Figure 39: Heart - Two Paths

As an open Navigable Space, *Heart* contained elements of the puzzle (which allows for the testing of hypotheses), and of play. Interaction is kinaesthetic, following paths which slowly unfold through a smooth fading in and out, demanding viewer investment in the decision to explore any particular area. This slow and gentle movement is offset by more sudden changes. Viewers enjoyed the patterns made by the trailing hearts, and the simple joy of moving them by hand gestures, rather like kite-flying. *Heart* relates to the early work *Love*, and offers an idea which is easily internalised by viewers. This offers the possibility of affectivity through an intense and sustained personal engagement, identification with the symbolic avatar, and a highly subjective interpretation.

This recalls observations from Hills (2002) on the Fandom model centring on objects which offer endlessly deferred narrative, leaving some basic concept or model not fully revealed and constituting a private narrative space - large but

divisible into pieces, and with a consistent internal logic. The Fandom model does not otherwise map easily on to a single work of art. However, Heart offers a performable microcosm of a highly emotive world which is both personaliseable and cathartic. The Fandom model suggests that emotional involvement and participation are tied together; Fans - and so viewers - will argue over meaning and interpretation because they have an investment, and a personal identification. The participation, the performance of the work enhances the emotional involvement.

Figure 40: Heart - Combining "Painted" and "Stained Glass"

Visually, *Heart* also explores interaction dynamics - their pace and intensity. Too much concentration on the contemplative must be balanced by some of the speed and imperative of a game. Thus the process of learning the interface becomes a narrative which mirrors the other narratives - how we learn, fail to learn, or attempt map old solutions onto new and different relationships. In some sections the viewer must take a laborious action, quite slowly, while in another she must react speedily to remove incursive images that block the way forward.

Humour here becomes an element in the interaction dynamic - the unexpected, the joyful as a trigger for moving between a slow contemplation and an intensive pace - helping to move the viewer between immersion and reflection. This cumulative time-based exchange between the work and the viewer forms a

dramaturgy of interaction with shifting pace, intensity, role, gaze, and perspective. The viewer's actions are needed to drive the animation or narrative, and this therefore propels her between immersion and distance. Humour is in tension with the traditional notion of gallery-based painting. Like the notion of play, it can be freeing, opening the viewer's mind to receive new ideas and allowing her to forget herself and become emotionally engaged in the work, through a dissolution of the split between inside and outside - between the experience and the observation of the experience. Humour can be a mediator for difficult or negative emotion, drawing the viewer in to engage with challenging ideas, and a humanising force upon a machine process.

7. Successes, Failures and Conclusions

Summary

This study investigated computer-based interactive art, in the context of an individual, studio-based and non-networked practice. It explored the genealogies and developments of interactive art, taking in models of interaction from both traditional fine art and New Media; and from the disciplines of Education, Theatre, Computing, Ritual and Play. From these, it drew useful models for informing an interactive art which is both communicative and emotionally engaging. It examined existing taxonomies of interactivity and identified some useful key measures and models, which are outlined below. Key problems were identified in the New Media interaction model, centring on the emphasis on human-human interactivity, the dispersal of authorship and control, leading to a de-emphasis of intrinsic meaning and communication between artist - or artwork - and viewer communication. This included the problem of 'guerrilla' interaction – disruptive or destructive input by viewers adversely affecting that of other viewers. Problems were also identified in the de-emphasis of the visual and a lessening of emotional engagement, identified as important to the artists but also – from an examination of Audience Studies, to the viewer.

Early solutions centred on the application of identified models to working practice, and attempts at developing a complex interaction based on the notion of the computer as agent capable of simplified dialogue. This included simple measures to maintain the work's integrity against 'guerrilla' interaction. These attempted to answer the original research questions:

- How can an interactive artwork function as a communicative object with some intrinsic meaning or content, and what models of interactivity are helpful here?

- How well can a machine process reflect and contain the human; how well can computer-based interactivity engage the viewer - or the artist – affectively?

Later, the emphasis shifted to a more medium-centred exploration of the nature of the computer as a visual, as well as a behavioural medium, in the context of artist's film and painting. The investigation of the visual language became a process of befriending the machine, and identifying how that language relates to the language of behaviour and the dynamics or dramaturgy of the interaction. This began to address the identified research question:

- How well does the notion of interactive art scale down to a single, non-networked and small-scale work dependent upon standard input mechanisms; how rich, how intuitive an interactivity can result from a studio-based practice - and how rich, how interactive does it need to be to engage the viewer?

An exploration of the characteristics of the monitor-based and projected image led to the adoption of simpler interactions within a richer visual and aural environment. This investigation produced a much simpler question

- Is Interactive Art necessarily located within New Media, or could it be regarded as a reinterpretation of Painting; and what would that 'Interactive Painting' be?

Findings

Elemental Interactivity

The study identified successful models of interactivity for a genre of Interactive Painting. Firstly, an elemental interaction was identified; one that is intrinsic, and related to both the form and the content. It is not divisible from the work, but an integrated element, in which the work and its behaviour are one. This incorporates both Birringer's notion of dialogic interaction and Penny's auto-pedagogic interface; of works in which communication and understanding come naturally through the viewer's choosing to engage with a pleasurable interaction. This relates to an Education model of interaction, and of Guided Discovery.

Making Cognitive Interaction Concrete

In this model, physical interactivity is identified as a means of making cognitive interaction concrete, giving it visible form to allow exploration and testing. The work's behaviours are related to the behaviours of real-world systems, ideas or

models, so that engaging with the one promotes an engagement with the other. This offers a way of making explicit and visible the viewer's gaze or thought process, and articulating connections. The links and dependencies, and the viewer's journey around and through the work are therefore explicitly made available for reflection.

Interpretive Interactivity

The study identifies Interpretive Interactivity; the means of viewers engaging with, and understanding, existing meanings in the work, through a process of personalisation. This is in opposition to creative interactivity - where the emphasis is on viewers generating new meanings through the addition or alteration of content. The works in this study are not capable of permanent change or augmentation by the viewer. Elements of creative interaction and of free play are possible, but the ultimate form of the work remains the same for each viewer to explore anew. This contributes to a sense of intimacy, individuation, but also circumvents the problem of 'inappropriate' viewer interactivity.

The notion of Interpretive Interactivity also includes the idea of layers - visual layers and layers of meaning - to be uncovered over time, according to the viewer's level of interest. It offers a way of accessing different narratives or slants of understanding, which are integrated into the work, in the form of image, text, or sound. This allows a large amount of visual, aural, behavioural language to be included without confusion in the model of a multi-layered Navigable Space. This can incorporate clear or oblique interpretations and expansions of the central idea of the work. However, this works best when it is subtle and non-didactic, leaving gaps for the viewer to fill with her active imagination.

Exploratory Interactivity and Navigable Spaces

Exploratory Interactivity was identified as a key basis for Interactive Painting as an open-ended navigable space, which can be explored at a pace controlled by the viewer. This open exploration can then be balanced by elements of creative interactivity, goal-based sections, or symbolic activity, representing viewer commitment and which is not random but itself holds and reflects upon meaning

in the work. This balancing offers some dramaturgy of interaction. The work is not cast as game, toy or instrument, although it has both playful and play-able elements. Rather than 'control' or 'activity', it offers exploration, discovery, and persistence; exploring time as a formal element and a parameter of immersion and contemplation.

Wholeness

Underlying the notion of explorable, navigable spaces is the notion of the work as essentially whole. In opposition to the database or informational model, this posits the work as a single object or entity which behaves, or changes. This uses a model of a finite world, seen through the perspective of the avatar (*MyWorld*) or the behaviour of its inhabitants (*TVHouse*). Later works introduce what might be seen as a conceptual shift towards viewing these behaviours as those of the world itself, as symbolic of a single expanded idea being explored, as in *Heart*, or the notion of a whole world which the viewer then attempts to bring into balance, as in *Passion*.

Intuitive Interactions and Real-World Models

This then offers the viewer intuitive interaction, employing simplified real-world models, which she can perceive as a specific action rather than a 'choice' or input/output exchange. This makes use of an intuitive mapping between on-screen interaction and the communication or behaviour - of viewer or work - that it represents. The works sought highly intuitive control mechanisms; however this was not always achieved. A more scientific method of feedback gathering would be required for each individual work to determine usability. This is not practical, unless the practice were to be restricted to a small number of standard interface mechanisms, although existing recommendations from HCI can be incorporated. In the context of Painting, and the highly personal affective viewer response, I feel it is acceptable to create works which are puzzling, even frustrating, provided they offer some accessible route to engagement. More investigation into how and precisely where the works are ultimately shown may suggest further use of printed instructions and labels. However, these would simply advice the viewer on how to navigate the works, rather than informing her how she should understand or feel about them.

Simplicity

Related to the need for intuitiveness, simplicity was identified as a key factor in interactive painting; simple viewer actions of point-and-clicking, rollovers, following or drawing lines, moving on-screen objects, or simple click-and-drag drawing or clearing (erasing) actions. This small library of actions is re-used throughout the works so that viewers can generalise and this helps the actions become intuitive. These works should not try to be Interactive Fictions, nor Literature, and where the earlier works tried to say too much or be too clever, too literal, the later works attempt rather the small and intimate, offering a personal but generaliseable emotional involvement. This suggests an intimate immersivity, which is also supported by the use of slowness - of gentle fluid interaction mechanisms, small gestures, and a graceful interaction, which unfolds over time and integrates with a rich visual and aural environment that rewards slow contemplation. This simplicity provides a counterpoint to visual richness, and is informed by models from Theatre and Experience Design, suggesting limited actual interaction but high viewer perception of it.

Gestural Interaction

Within this notion of the intimate and simple, the model of kinaesthetic interactivity can successfully be reduced to a Gestural Interaction. This includes small-scale gestures, both the autographic human input, and the purposeful movements required by viewer interactivity. The use of devices such as the trailing hearts in *Heart*, and the drawing lines for the avatar to walk along in *MyWorld* makes these gestures pleasurable in themselves, and effectively amplifies the movement - in space or in time - to describe or reveal patterns. This - in *Heart* - provides a playful element which can be contrasted to the more emotive imagery.

Immersion and Reflection

The shift between immersion and reflection has been identified as important, in order for the viewer to make sense of and internalise what she sees. This study identifies pace, humour, surprise, or curiosity as means of moving then viewer from one state to the other. The more mature works (*Window, Faith, Heart, Passion*) achieved a high degree of immersion and a visual richness. They

maintained a balance between an engagingly playful exploration and action, and contemplative, emotive imagery, using the shifting between the two to move the viewer between immersion and distance. The absorption of immersion in image and exploration is tempered by puzzlement, and the urge to drive forward the narrative by the desire to stay and enjoy the rich media. Thus the successful works offer a contemplative, atmospheric, and partially immersive experience balanced by the requirement of effort.

Interactive Painting

The works in this study can be seen as fitting into a context informed by Artist's Film, by backlit photographic transparencies and the development of digital painting and print, by a traditional Painting practice and by developments in interactive New Media. By investigating the differences and similarities, it is possible to arrive at a reinterpreted medium of Interactive Painting. Whilst viewers may be uncomfortable without a clear context, the notion of a new or reinterpreted medium can offer a fresh experience to the viewer who must explore it on its own terms, and for its own specific nature without all the preconceptions of an established medium. Because the work is interactive and time-based, the viewer can *keep* looking at the work afresh. Krauss (1999) suggests this could constitute a new medium if it has a grammar, syntax, rhetoric and a means of determining competence. It must have sequels, not exist as a single utterance. She further suggests that the artist must engage with the specificity of the new medium in order to do more than pastiche.

Similarities

Interactive Painting resembles Painting - and importantly, since Painting is not one single holistic practice, resembles my own former painting practice - in a number of ways. It is expressive, immersive, rich, imaginative, and concerned with the visual. Early works in this study struggled to find the right visual and behavioural language, and the right balance between co-ordinated elements of form, content, concept, and behaviour. Ultimately it was necessary to move away from the central concept of interactivity in order to find it.

Interactive Painting has intrinsic meaning, communicating both intellectually and affectively. As the work begins to deal with the human, the visual and not the

technological, it regains its emotional authenticity, and ability to represent the individual, personalised view. As Lister et al point out, works have meaning for the viewer when they embody and speak to the most common human fears, anxieties and wishes. (Lister et al, 2003). Like Painting, Interactive Painting uses colour, visual texture and gesture to express these emotions; it also uses sound as a powerful emotive sense, responded to on a deep level. While the emotional honesty permits viewers to share and empathise; the balance offered by the playful and the sensual or kinaesthetic permits the work to be neither simply cathartic nor emotionally manipulative but affectively engaging.

Like Painting, it is capable of exploration over time, and of supporting the construction of narratives over time, both can operate as navigable spaces but Interactive Painting can additionally record the viewer's progress and processes and give these concrete form.

Both contains the human trace; effortful, physical, kinaesthetic. Rather than recording and reflecting the human presence itself, as a film- or photographic-based aesthetic, they offer a trace of the artist's intimate human gesture. Interactive Painting additionally offers the viewer's trace.

The working progress can be intuitive and impulsive. The works in this study have demonstrated that, while a computing model would require pre-planning and calculation, it is possible to approach Interactive Painting as open-ended and exploratory, intuitive processes. This is made easier by a move to a simpler computational process, which helped keep the emphasis of time and effort on the visual, apparent in the maturing forms of the work. This permitted the working practices of Painting and Interactive Painting to begin to converge.

Conceptually, Interactive Painting, unlike most New Media, is self-contained, singular, although it refers to its own cultural context and history. It seeks a homogenous, definitive and final version, although there may be 'sketches' and related works or series. The revisiting, the viewing afresh of old work in order to recreate it in the light of new knowledge has helped to sustain a relationship with the work after it is completed, and to make extended use of a good idea,

whilst never simply repeating any work or failing to complete, or bring it to closure.

Differences

Unlike Painting, Interactive Painting can contain sound, animation, movement, and retain separate layers or elements, capable of shifting and altering independently within an apparently homogenous image. It changes visibly - and aurally - over time, and as a result of the viewer's action, in ways which are not random but build towards an understanding of the work and its behaviour. It permits the viewer to focus on one aspect or visual area of the work by altering, separating or removing elements, by allowing the viewer to control the speed of animations (as in *Window*) or physically remove layers of image or sound (*Passion*) or by marking the surface to customise the image (*Faith*). It has a resting state to which it returns, although this state itself may be one of movement, of animation.

Interactive Painting can be controlled by the viewer, and the viewer's exploration of the image, the experiments she makes or the theories she constructs can be made visible within the work. The viewer's trace and the work's behaviour are thus made visible and explicit. Unlike Painting, Interactive Painting cannot contain a snapshot of its own narrative, story or meaning but this must be constructed through the interactivity and the behaviour; it must unfold over time. Time is used as an element in Interactive Painting, but unlike the Game model, it offers a slow time, a contemplative mood, encouraging a lengthy engagement. This is part of a dramaturgy of shifting intensities, speeds, complexities and moods against which this contemplation is set.

Painting on a computer must engage with the specifics of the computer as a tool, support and medium - for the image and its related behaviour. Rather than impersonate physical painting techniques, in the manner of some digital painting softwares, Interactive Painting seeks the intrinsic qualities of the medium. Unlike Painting, Interactive Painting is constructed from direct light and therefore has particular visual qualities of saturation, intensity, luminescence; this light spreads beyond the picture plane to affect nearby surfaces, surrounding the viewer with de-focussed reflections of the image and its

movement. Movement, and shifts in focus are essential qualities of Interactive Painting. The computer-as-visual-medium offers homogeneity of image, within which all marks, however they are made can be made to combine harmoniously. Unlike paint, within the computer support for the happy accident and the 'spontaneous' behaviour of the medium are limited; however they are supported and can be controlled and adopted into the vocabulary of the medium. With some effort by both machine and artist, a richly textured but homogenous image can be successfully animated, such that it appears the image itself, rather than elements within it, is behaving.

Interactive Painting is not solid, and has no object - no real tactility, nor gentle organic aging but rather the ethereality of projection. The scale and the nature of the surface onto which it is projected can be changed. It is capable of infinite reproduction so that it can be seen by many in its original format and quality; but this should not imply deferred completion of the works, or proliferation of alternatives. It cannot be owned or traded as currency, but can be shown in multiple venues and taken to where traditional paintings might fear to tread. Interactive Painting is intended to be shown in a gallery; some pieces hung on walls, some projected in darkened rooms with comfortable chairs; but it allows the possibility of other venues. It intentionally sets up tensions between its behaviour and Gallery expectations - both traditional and the newer hands-on-educational paradigms - between the mystic or magical and the playable. It introduces humour that may be wry but is not ironic; the interactivity offers a collision between the notion of the traditional gallery and the expectations of digitality. It provides an important tension, a liminal space between two comfort zones. Hoberman (2001) has suggested that interactivity *should be* problematic; a tension between expertise and frustration, not always pleasurable and not always transparent.

Interactive Painting is not a school, ism or theory but rather aims to apply an aesthetic from Painting to an interactive medium; to invest the computer with the affective potential of the painting through softening the hard-edge of assemblage and bricolage, or slippery surface of the photographic, and adopting the expressive human gesture. It aims for the experiential, and to be

comprehensible to the gallery visitor, sufficiently accessible to invite a continued and in-depth engagement

It is not net.art, nor web-based art, but exists in its own space and attempts to transform it. It is not New Media - it does not concern itself primarily with interpersonal interactivity, with the politics of dispersal or the digital, Posthuman condition. It is hardly Postmodern, demanding the continued life of the author, an unfashionably single-minded vision, drive and creativity, and the centrality of meaning - open to internalisation and interpretation but retaining an intrinsic meaning and communication.

Interactive Painting is not Computer Art, and does not use all the capabilities of the computer. It offers an ability to remember and adapt; but rather than explore high-end technology, it employs a small and simple imprint memory of recent events or measurements, of time spent or actions repeated. While earlier works in this study concerned themselves with a critique of technology, the final notion of Interactive Painting stands aside from it. Rather than self-reflexive examinations of digitality or technology, it aims to explore the Human, and the aspects of the personal which are common to us all. It does not try to *be* human, but to reflect humanity. This answers Krauss' suggestion that in order to reinterpret a medium it is necessary to believe in it as redemptive, as positive, not simply as critical (Krauss 1999).

This study has successfully answered the objectives identified in the introduction: to make interactive pieces which are intuitive and stand up formally and visually, as artworks and paintings; to make pieces which are comprehensible and in which the interactivity is the means of telling of stories or asking of questions.

The third objective was; to make computer-based pieces which match the emotional, sensual, affective potential of the earlier object-based practice, through both their visual and their behavioural qualities. It has been possible, by shifting the emphasis from the technological to the visual, and from the concept or theory of interactivity to the practical exploration of a medium, to reaffirm the artist's emotional connection with the work. This was further helped by adopting

a working method that encompassed the intuitive and visually-led. Feedback from viewers indicates an emotional connection through the use of real-world models, Gestural Interaction, pacing and an aesthetic informed by rich, textured and layered surfaces and affective sounds. Questions of viewer understanding and what they seek and find in an interactive painting need to be more closely examined and researched. However, indications from sample feedback suggest that viewers find in these works a balance between emotional immersivity and curious exploration. The important question of how they regard the work, how they classify it and the expectations they make of it, can be further examined by a Social Science based study. Interactive Painting's attempts to be accessible, will help viewers engage even if they are uncertain how to classify the work; showing the work through the Gallery system, framing it, and maintaining a contemplative time-frame may enable it to be recognised as 'Art'. The curation and marketing of such work is an important influence here.

In the blurring of boundaries, the co-option of media and their aesthetics by other media, it is difficult to draw a line around this reinterpretation of Painting that would satisfy Krauss' conditions of Grammar, Syntax, Rhetoric and Competence. When is Interactive Painting actually an installation and vice versa - particularly if the image is large and projected? Interactive painting is essentially a single image, which behaves. This simple definition might also describe, for example, Penny's kinaesthetic-interactive installations, but the formalisms employed are derived from painting, the conceptual model is from a studio practice and the interaction paradigm uses interaction not only to form an emotional engagement, but to uncover metaphorical and literal meanings.

If one applies Krauss' terms in a linguistic sense, what emerges is perhaps not so much a language as a vernacular. Horrocks (1987) describes competence as a tacit or unconscious knowledge, not based on an ability to enumerate rules but having sufficient introspective intuitive understanding to communicate and understand communication through a given language. On this basis, it is possible to identify, for Interactive Painting, a recognisable way in which form (and behaviour) signals meaning; through symbolic referents and traditional associations of colour and form, through standardisation of behaviours and semantic signals indicating behaviour as attached to specific objects. If the

object is not visually differentiated from the image as a whole, it is determined by the inflexion of a cursor, or an animation. In the time-basis of the work, the order of accessing those forms and behaviour contributes to the meaning, and distinctions can be made in different interactions between speeds; levels of urgency; graduated or discrete nature, repetition and levels of complexity. Importantly, language is not merely regular and logical but develops and evolves through use - as, it is anticipated, this practice will continue to do.

The works in this study are not a discrete and finite experiment. Although they represented a radical departure from my art practice at the beginning of the study, they subsequently curved, or spiralled, back to explore the boundaries and possible overlaps of the old and new practices. A point of conclusion, a finite definition of achievement can be drawn, but the work will continue. The possibility of taking the works off monitor and into projection is a large area I propose to explore further. Attempts to create a strong and well-defined back-projected image coupled with a more diffuse ambient image might be addressed by the use of two projectors showing the same interactive image. This model also offers the possibility of combining a forward-projected image to be seen by viewers who can interact with it, and the same image interrupted by the primary viewers, providing an ambient sense of place. In the darkest days of the study, the attempt to combine a limited use of familiar technology with a traditional notion of practice - and to do so in a context of ever-more-complex and powerful technical systems - seemed misplaced. The comforting smells and textures of the painting studio offered a temptation right away from an almost impenetrable wealth of data, theory and argument. Now, however, following the success of experimentation and perseverance, I have arrived at a model of a communicative practice with which I can sustain an enduring and affective engagement and which still presents a huge avenue of exploration.

Appendix 1: Disner summarised

Troubles with a Narrative, from Writing Fiction (Disner, 2001)

Disner's recommendations for fiction writing, offer much that resonates with the creation of interactive art.

To summarise, he suggests that

- the author must be engaged with the subject
- the content must have authenticity and depth (there may be more behind the narrative that is not revealed but informs it nonetheless)
- it must be intrinsically interesting to the reader, the reader must be moved emotionally
- it must be significant, and contextualised in the wider or real world
- there must be a balance between instruction and story
- the overall narrative must not be overwhelmed by subplots or tangents, but there must be tangents
- there must be some imperative - a goal or aim, a sense of urgency, or an offer of closure
- there must be a narrative shape in which the opening is not too slow
- the timebase must not be over-confused
- the degree of detail must over time
- and the end must be emotionally satisfying, consistent, and tie up loose ends
- the story must follow consistently but
- not be formulaic - it must offer some surprises for the reader and some doubts about the outcome, identifying crucial points and withholding or delaying information about them
- the narrative must contain different views, or viewpoints
- the writer must identify which parts of the narrative need enactment, dialogue, interaction, and where gaps should be left
- the writer must give the reader the information she needs to make decisions or reach understanding, or give clues to allow her to deduce the existence of this information

Appendix 2: Questions from MA show

What is your relationship with Art?

What is your relationship with Computers?

What do you look for in an artwork?

Do you feel that being able to interact with the work
- helps you engage with it?
- hinders your engaging with it?
- neither

How would you describe the way you engage with it?
playful / emotional / contemplative / exploratory / superficial /funny /
something else……..

Please describe how the work makes you feel…

Do you feel that interacting with the work…
- helps you "understand " or find some meaning in it?
- hinders your understanding?
- neither
- wasn't trying to understand it anyway

Do you feel that the work is :
toy/ game/ story/ puzzle/ painting/ movie/ just art/
something else……

Do your answers relate to
- Window (projection)
- My World (little cartoon person)
- House of the Spirits (skeleton)
- Faith (gongs)
- Generally to all

Would you be interested in downloading other works to view at home, and then sending feedback? If so, please leave your name and email address
……..

Appendix 3: Questionnaire

MY WORLD

Please have a look at the application called "My World", and then make any comments you want under the general headings of the questions here. Use the back if you want more space. Please also ask any questions you may want to, but do this AFTER writing your comments.
Thanks for taking part in this very informal feedback. Fin x

1. Do you think "My World" is

	a game
	a story
	a puzzle
	something else - what?
	just for fun
	has some kind of point

2. Who do you think the Blue-eyed character ("Me") is

3. A. If you think there is some point or story, what do you think it is?

3.B. If you think there isn't - do you think there SHOULD be? Why?

4. Does "My World" make you think about /or ask yourself questions about/ anything in particular - if so what?

Technical Stuff -
5. What things went wrong/ don't seem to work properly?

6. Which things didn't make sense to you or were annoying?

7. Which things/aspects did you like?

8. Are you interested in/ working with/ **Interactive Multimedia**?	very	fairly	not really	No
9. Interested in/working with/enjoy **Art**?	very	fairly	not really	No

10.If so, what sort of Art do you prefer?

11. Do you already have any views about Computer-based art/ New Media that inform your response to My World? What?

Appendix 4: List of Works Included on the CD

This represents the works discussed in the text. The work "Building" (2002-3) has not been included as it was never satisfactorily resolved on a level of reliable functionality. Similarly the non-interactive version of DIYReligion (2003-4) has not been excluded as a discarded experiment.
All these works are PC versions, and should run at 1024x768 resolution, 32-bit colour, with sound enabled. Works marked (*) include sound. Works marked (#) are intended for viewing as projections - others are intended for viewing on a monitor.

What? 2002
Pet God 1 2003
  This work must be installed on a computer to run. It will generate 3 files into the same directory as the application
DIY Religion *# 2003
Map of the World 2004-5
Reality TV # 2005
  This work needs to run on a computer with a graphics splitter and connected to two monitors each set at 1024 x 768
Skin 2005
  This is an interaction experiment included to illustrate the text
Skeletoon * 2005-6
  This is a non-interactive animation, included to illustrate the text
World 1 - version 1 2005
World 2 - version 1 2005
Love 2005
House of the Spirits * 2005-6
Window # 2006
Faith *# 2006
Pet God 2 (see Pet God 1 above) 2006
World 1 - version 2 # 2006
World 2 - version 2 # 2006
Collider scope # 2006
Trees # 2006
Passion *# 2007
Heart # 2007

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Interview1 (2005) interview with visual artist. Newcastle, 10th March 2005

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