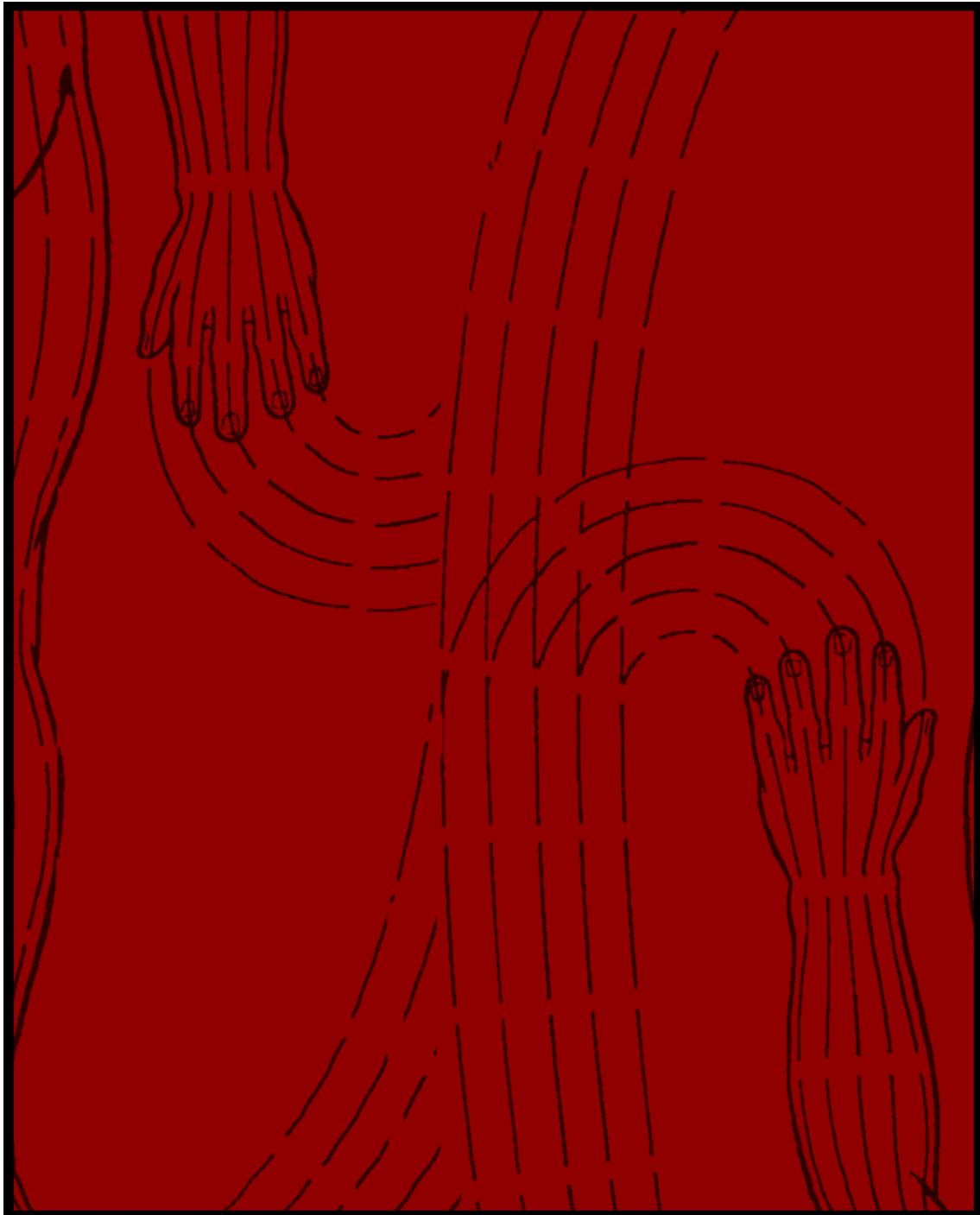


The Fibreculture Journal

DIGITAL MEDIA + NETWORKS + TRANSDISCIPLINARY CRITIQUE



Issue 21 :

Exploring Affective Interactions

edited by Jonas Fritsch and Thomas Markussen.



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About the Fibreculture Journal

The Fibreculture Journal is a peer reviewed international journal, first published in 2003 to explore the issues and ideas of concern to the Fibreculture network.

The Fibreculture Journal now serves wider social formations across the international community of those thinking critically about, and working with, contemporary digital and networked media.

The Fibreculture Journal has an international Editorial Board and Committee.

In 2008, the Fibreculture Journal became a part of the Open Humanities Press , a key initiative in the development of the Open Access journal community.

In 2012 the Fibreculture Journal celebrated ten years of open access scholarly publishing with the publication of its 20th Issue.

The journal encourages critical and speculative interventions in the debate and discussions concerning a wide range of topics of interest. These include the social and cultural contexts, philosophy and politics of contemporary media technologies and events, with a special emphasis on the ongoing social, technical and conceptual transitions involved. More specific topics of interest might include:

- :: informational logics and codes
- :: the possibilities of socio-technical invention and sustainability
- :: the transdisciplinary impacts of new media technologies and events in fields such as education, the biosciences, publishing or knowledge management
- :: information and creative industries, media innovation, and their critique
- :: national and international strategies for innovation, research and development
- :: contemporary media arts
- :: new forms of collaborative constitution made possible by contemporary media
- :: software and hardware develops in relation to the social
- :: networks :: media change, convergence and divergence
- :: the use of contemporary media in socio-technical interventions

The Fibreculture Journal encourages submissions that extend research into critical and investigative networked theories, knowledges and practices.

The Fibreculture Journal values academic scholarship in the field, and demonstrates this through the publication of refereed articles. The journal is fully supportive of Open Access communities and practices, and is committed to contemporary metadata provisions and uses. It is also open to expanded notions of scholarship which might include collaborative hypertexts, database compositions, and low-band electronic installations that experiment with the philosophy, politics and culture of information and communication technologies.

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Editorial:

Exploring affect in interaction design, interaction-based art and digital art

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The notion of affect does take many forms, and you're right to begin by emphasizing that. To get anywhere with the concept, you have to retain the manyness of its forms. It's not something that can be reduced to one thing. Mainly, because it's not a thing. It's an event, or a dimension of every event. What interests me in the concept is that if you approach it respecting its variety, you are presented with a field of questioning, a problematic field, where the customary divisions that questions about subjectivity, becoming, or the political are usually couched in do not apply.

(Massumi, Of Microperception and Micropolitics, 2009, p. 1)

The aim of this special issue of the *Fibreculture Journal* is to address some of the contemporary challenges involved in working with affect across disciplines and practices that centre on the use of interactive- or digital technologies. The issue has a special focus on interaction design, interaction-based art and digital art. The pivotal question, as we see it, might be framed roughly like this: How do we explore the "field of questioning" that arises when we approach the affective in relation to interaction design, interaction-based art and digital art? What is the use of disciplinary goals when the affective has been proven most valuable in trans-disciplinary theory? Where do we go from here, that is, how can we continue working with the notion of affect, develop it in new theoretical, analytical and practical domains? What key concepts would emerge from this continued trajectory and how would they feed back onto the theoretical propositions? How would they resonate within and with-out existing disciplines, creating novel links and assemblages?

With this special issue we present ongoing practices across disciplines that all engage with this challenge of working with affect—both analytically and artistically, but always creatively. We are especially interested in the way in which changing concepts of affect are taken up and modulated within interaction design, interaction-based art and digital art. For example, some concepts of affect coming into these areas go beyond the “personal” interaction with the technology, indeed beyond (or run beside) many of the assumptions of interaction design, including those grounded in phenomenology. They understand affect as an impersonal as much as, or even sometimes as opposed to, an intimate dimension of relational capacity. As proposed in the work of Deleuze and Guattari, and more recently, in very different ways, in the work of Brian Massumi, Patricia T. Clough, Nigel Thrift, and others (see below), affect comprises intensities and speeds, in which the living and nonliving, human and nonhuman, differentially affect and are affected by each other. Such new understandings of affect have consequences for notions of interaction or interactivity, and meet other concepts of affect and interaction in ways that challenge basic assumptions about interactive media and digital technology in material, processual and experiential terms.

It is important to underline that this issue of the *Fibreculture Journal* is not concerned with the ‘affective turn’ per se. Rather, assuming the importance of considering affect across a number of disciplines, we are particularly concerned with affect as it is worked with in interaction design, interaction-based art and digital art. As Marguerite La Caze and Henry Martyn Lloyd clearly demonstrate in their introduction to the *Parrhesia* issue on ‘Philosophy and the Affective Turn’, studies of affect have a long history within philosophy (La Caze & Lloyd, 2011). In their introduction, the ‘affective turn’ is used to describe a specific phenomenon in cultural studies/critical theory in the 90s marking an increased cross-disciplinary research interest in pre-cognitive bodily forces, notably in how these forces are involved in the construction of human subjectivity, identity and our engagement with other people and technology.

However, after years of intense study we have now reached a point where the analysis of the affective has proliferated and spread into a number of disciplines in an attempt to enrich the understanding of the pre-individual forces that function on the level of the formation of experience—from the micro-perceptual to the macro-political (Gregg & Seigworth, 2010). Lisa Blackman and Couze Venn have edited a special issue of *Body & Society* in which they attempt to sketch out the kinds of trans-disciplinary collaboration and engagement enabled by the concept of affect as these have emerged across the humanities and the natural, social and human sciences (Blackman & Venn, 2010). Indeed, Brian Massumi has described affect as a “world-glue” (2000: 187), bringing together different levels of experience and working across traditional dichotomies. As such, it seems that affect also has a further role to play as a kind of “disciplinary-glue”, making disparate practices resonate through the conceptual development and practical exploration of affect—and derived concepts, analyses and

experimentation. Rather than seeking a unified understanding of what constitutes affect or the affective, it will be necessary to develop rigorous approaches across disciplines under an affective heading, thus bringing forth the multiplicity of these affective explorations, ensuring an enriching dialogue in-between disciplines, and reaching out of an academic context as well.

In an afterword to the above-mentioned special issue on affect published by *Body and Society*, Patricia T. Clough offers interesting ideas about the future of affect studies but leaves the question of technology relatively unaddressed (Clough, 2010). Turning towards the field of Human-Computer Interaction (HCI), however, a range of technology-oriented experiments have been carried out in the name of Affective Computing (e.g. Picard, 1997) or Emotional Design (Norman, 2004). These approaches have been criticized within HCI for reducing the complexity of the affective in an attempt to make it formalizable and structurable in computational and informational terms (Sengers et al., 2002). Recently, this informational approach to understanding affect has been countered with what has been termed an interactional approach (Boehner et al. 2005; Höök et al., 2008). Here, an alternative model of emotion as interaction is introduced, allowing an investigation into how interactive systems are experienced as culturally mediated and socially constructed. The relation between the affective and emotional remains relatively unexplained, however. All this leaves us with a possible space of resonance for many of the findings arising from the affect theoretical work done in and around cultural and critical theory.

Patricia T. Clough's introduction to 'The Affective Turn' from 2007 is explicitly concerned with how the 'affective turn is necessary to theorizing the social' (Clough, 2007). Nigel Thrift identifies five different schools of affective thinking in 'Turbulent Passions' (Thrift, 2007). Interestingly, coming out of psycho-geography and non-representational theory, these schools end up mixing together new theoretical assemblages. Brian Massumi offers another affective trajectory. In Massumi's work, the philosophical focus moves from Spinoza's basic notion of affect as the ability to affect and be affected, through the writings of Gilles Deleuze, to other conceptual allies, Gilbert Simondon and Alfred N. Whitehead, at the same time making references to work in developmental psychology carried out by Daniel Stern, as well as building heavily on William James' notion of radical empiricism. For Massumi the notion of the affective has been central for re-conceptualizing the emergence of subjectivity, which is not a pre-given entity. One aspect of this is the way in which interactive media and technologies may open up new territories for engaging pre-cognitive sensations and feelings in bodily experience, in what are sometimes referred to as 'technologies of emergent experience' (Markussen, 2005: 2). This re-conceptualization has not only been valuable for understanding the aesthetics of interaction as it is continuously explored in interaction-based art, digital art, design and architecture (see e.g. Massumi, 1998 & 2007). It has also become clear that we need to include the *political* and *ethical* in the notion of the aesthetic, which in

Guattari's terms leads us to consider the aesthetico-political. Bodies always find themselves affected by fields of forces—forces of ideology, techniques and practice—that attune these bodies to certain regions of action or potentialities for action (Massumi, 2008: 6).

With the advent of new media and related technologies, artists and interaction designers are offered rich opportunities for exploring the many intersections between affect, sensation and action. At the smallest scale we find imaging technologies that allow artists such as Olafur Eliasson or Bill Viola to explore microscopically affective layers of sensation, of which we may not usually be consciously aware. Turning towards the area known as tactical media, one could also find examples such as surveillance technology used subversively in public space, either to enhance the affective social attunement between bodies—as in projects by Rafael Lozano-Hemmer, Markus Kison or Ben Rubin—or as an instrument for micro-political acts of resistance that disrupt existing systems of control and power in order to liberate the body and construct counter-publics—as seen most vividly in *iSee* by The Institute for Applied Autonomy or Roderico Dominquez's *Transborder Immigration Tool*.

It seems we are at an important point in the exploration of the affective today, one at which we are moving from arguing that it is important or even necessary to consider affect, to actually working with how affect theory changes different kinds of practices—and not least how these practical explorations feed back into and change the theoretical assumptions. This is why we are interested in how concepts and meetings of concepts feed into the practices that we find in interaction design, interaction-based art and digital art. How do you design affectively, for instance? How can we use the insights from and around current explorations of affect in a continuously mobilizing and dynamic way, creating new relational events across disciplines and practices, feeding into new ways of thinking, doing and acting? If the concept of change is so integral to the understanding of affect, how might we actually start “living” by it—academically, or in the manner of practice-based research, research-through-design or research-creation? What kinds of politics does the concept of affect offer? If, as Brian Massumi states, it is possible to talk about the affective as bringing about an expanded empirical field in various disciplines, how might we continue an exploratory politics of radical change pursued by other than philosophical means? And how do such questions come into interaction design, or the more general meeting of technology and the social?

Affect has been coupled with the notions of interaction and the virtual in an attempt to increase understanding of how technology engages and re-distributes human bodies in relation to processes, time and change. The need for addressing the question of what affect, as a new foundational concept, offers to the understanding of interaction design, interaction-based art and digital art seems clearer today than ever. From a variety of intersecting backgrounds, the contributions to this issue address this question in experimental, practical, and conceptually new ways.

We begin with Adam Nash's article, 'Affect and the Medium of Digital Data', in which he argues that the notion of affect is critically important for understanding how digital data lends itself as a medium and material for creating virtual environments. Too often, Nash's argument goes, the term 'virtual' is taken in the sense of virtual reality, a dematerialised realm of digital data, which is thought of as being ontologically distinct from material reality. While this idea of the virtual certainly was influential in the 1990s in terms of how, for instance, the internet was conceived of as a distant cyberspace, Nash is sceptical about it becoming 'a signifier for any interaction that is facilitated on a digital network and induces affect in the material world, or vice versa'. Drawing attention to his own artwork in *Second Life*, on the internet and elsewhere, Nash gives various examples of the way that digital data can be modulated so as to enable non-human and human bodies to engage affectively with each other, beyond the digital-material divide. This is perhaps experienced most evidently in *Trace Aureity*, an interactive audiovisual sculpture in *Second Life* where avatars gradually gain a greater degree of autonomy, thereby transcending 'the linear mapping between human user and the user's humanoid avatar'. Hence, for Nash, there is a need for an integrative ontology, one that views virtual environments and more generally 'virtual art' as 'a continuum of force and materiality which can be modulated and re-modulated by the artist so new cycles between digital networks and material reality can emerge, between non-human and human bodies.' And the notion of affect is a core concept in this ontology.

The idea that the notion of affect is key for understanding how digital technology gives artists access to work with hitherto unexplored forms of interaction is also central in the second essay, 'Affect and Care in *Intimate Transactions*', by Lone Bertelsen. Bertelsen shifts the focus of attention from ontology to ethics insofar as she discusses how ethics may be rooted in the way that bodies mutually affect and are affected by one another. In her article, she examines *Intimate Transactions*, an immersive interactive installation where participants situated at two distant locations can experience intimate transaction. Each participant uses a physical interface called a 'Bodyshelf'. By gently moving their bodies on the Bodyshelf they instigate intimate transactions, which influence an evolving world of non-human creatures. As these creatures meet in the screen-world, they can 'move together as one semi-merged avatar'. At the same time, vibrations onto the lower back and lower abdomen of the participant's bodies are activated. For Bertelsen, this can be seen as an instance of 'co-affective collaboration', which focuses on 'trans-subjective collaboration and a logic of affects'. This leads to a form of experience which cannot be adequately accounted for with the notion of interactivity. This is because, while the notion of interactivity presupposes the individual and the subjective as pre-existing categories, co-affective collaboration takes place at a pre-individual and trans-subjective level. In fact, the ultimate, but implicit conclusion of Bertelsen's argument seems to be that, in the vocabulary of media art theory, interactivity must be supplemented with trans-activity as a new foundational concept. For years critical thinking on digital art has put its trust into

the explanatory strength of interactivity. Bertelsen suggests that a re-thinking is necessary and that affect is a promising starting point for future work.

Susan Kozel's 'AffeXity: Performing Affect with Augmented Reality' situates us immediately in the middle of a transdisciplinary inquiry into affect in cities and a-fixity as an urban condition. In the article, Kozel unfolds the affective explorations carried out in an ongoing interaction design project, *AffeXity*, experimenting with artistic practices from dance improvisation, video shooting, digital image editing to sound composition, combined with the daily practices of moving through a city and using mobile devices. Kozel writes at the intersection between conceptual coherence and artistic direction in an attempt to bring to life the way that working with affect simultaneously modifies both theory and practice, in a writing style that brings to the surface the affective explorations involved. Thinking with and through affect theory, digital media and social choreographies, Kozel develops a notion of performance triangulated across bodily movement, emergence and shimmering. Starting from the basic assumption that designing affectively and designing for affect are two different things, Kozel proposes a range of affective sensibilities. Her work straddles practical and theoretical activities because 'it is used in the process of generating the movement and media at the same time, as it is a way of engaging with theories of affect—it is a method for generating artistic and theoretical content.'

In the fourth article Mark Gawne emphasises the lack of awareness inside compositionist analyses of the way in which affective technologies are used to organize labour in the post-Fordist condition. Theorists of affective labor such as Hardt and Negri have been successful in demonstrating that in 'the passage to post-Fordism, the labour of producing affects, communication, knowledge, the creation and maintenance of relationships and the cultivation of attention emerge as key economic terrains'. Gawne argues however that while these theorists have identified the need to consider the problem of immaterial production, they have less to offer in critiquing how technology is used and misused 'to subordinate user affect to the imperatives of capitalist valorization'. For over a decade, Human-Computer Interaction (HCI) has focused on developing 'technologies that aim to sense, recognize and modulate user affect'. However, through his critical and enlightening examination of recent developments in affective HCI, Gawne identifies a blind spot insofar as HCI research seem reluctant to consider the impact that these technologies have on the bodies involved. Gawne's contribution consists in integrating a discussion of affective HCI with the perspective of compositionist analysis. In so doing, he remedies the inherent limitations of both fields. The heuristic value of this endeavor becomes evident in Gawne's analysis of smile-scan, a technology developed by Japanese company OMRON for the purpose of measuring the face expressions of workers within workplaces.

The four articles are followed by two conversations. The first of these is 'Multimedia Mixing and Real-time Collaboration: Interview with Sher Doruff about the development and use of KeyWorx, the Translocal and Polyrhythmic Diagrams.' This conversation recounts a largely undocumented chapter in the history of the media art and technology nexus. While books on media art flourish that contain accounts of the ways that artists have exploited existing technologies coming out of research and innovation in industry for artistic purposes, the conversation with Sher Doruff is remarkable. It reveals the way in which artistic experiments themselves have launched new networking technologies which in many ways anticipate more recent developments in social networks. In a personal conversation with Andrew Murphie, Doruff takes the reader behind the performance scene in the 80s and 90s, where, as an artist, working in New York and Amsterdam, she collaborated with various performers, dancers, musicians, and programmers in developing Keystroke. Keystroke, or Keyworx as it was later re-named, is a virtual studio environment, which in 97 gave artists and performers the opportunity to engage in translocal, real-time collaborative performances. That is in 97! Even though the notion of affect may not appear to be placed at centre stage, the affective is felt to be present as a form of co-existence among the artists and performers, one for which the Keystroke technology is designed. In translocal performances an intense 'synchronous interaction' emerged between the performing bodies. Performers always need to find a rhythm together. But translocal performance, where bodies are separated, is different, or as Doruff explains: 'You don't have perceivable body language between you. So you have to find other ways to find that kind of synchronisation. It's incredibly intense and affective'. This affective synchronisation is not only being explored in many of Doruff's own art projects, which are presented throughout the conversation; it is also closely aligned to the co-affective experiences discussed in the earlier essays by Nash and Bertelsen.

In 'Entertaining the environment', a conversation between Andrew Goodman and Erin Manning, the affective is conceptualized in terms of 'relation', which is counterposed to 'interactivity'. 'Interactivity' or 'interactive art work' are two concepts used by Goodman and Manning to describe artwork, where the 'art event' is drowned out by the 'technology event'. Or, as Goodman says, works of art 'that seem invested in a demonstration of technology's capabilities (and/or the artist's technological skills)'. Relational art, on the other hand, is more interested in what art can do and not just what technology can do. It activates experiences that do not place the viewer at the centre of the experience, but invites her instead to participate in creating events, and this subverts the hierarchy of subject and object. This disruptive aesthetic effect or 'tweaking of experience' is not a result of technology use, but can be achieved by simple means and techniques such as those introduced by the conceptual art movement in the 1960s and 1970s. By tracing the roots of relational art back to conceptual art, Goodman and Manning point towards affective possibilities 'at the fringes of technology'.

Biographical Notes

Jonas Fritsch has a PhD in Interaction Design and is currently Assistant Professor at Aarhus University, Denmark. Here he works on a multitudinous thinking-together of interaction design and affect theory in conjunction with practical design experiments carried out at CAVI.dk (Centre for Advanced Visualization and Interaction) and at the Participatory IT Centre (pit.au.dk) in the Department of Aesthetics and Communication. Jonas holds an MA in Information Studies with a supplementary degree in Aesthetics and Communication from la Nouvelle Sorbonne, Paris, is a member of the SenseLab, Concordia University and participates in the editorial collective of *Inflexions*, a journal for research-creation.

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FCJ-148 Affect and the Medium of Digital Data.

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Introduction

This paper attempts a technical analysis of the medium of digital data to establish how affect may emerge in that medium. Two central questions here are, first, whether it is possible for two immanently digital entities to establish an affect cycle with each other, and, second, how this relates to affect cycles established between digital data and non-digital entities? It should be possible to build artworks that can test certain of their own intrinsic properties in both these respects. The author had a hand in creating some such artworks and these are examined later in this paper [1].

The constant movement of data in a process of modulation, demodulation and remodulation is one of the defining characteristics of the digital medium. Regardless of the final display characteristics and potential interactions of any given digital bit, it is constituted through a constant process of digital data modulation. *Modulation* is used here to mean the process of changing some phenomenon from one register into another, for the purpose of storage, transmission and display. The term also resonates with Deleuze's (1992: 3) sense of modulation as 'like a self-deforming cast that will continuously change from one moment to the other, or like a sieve whose mesh will transmute from point to point,' as well as the musical sense of changing key, the electronic sense of changing a signal with another signal or the social sense of changing one's tone of speech according to listener or circumstances. All these share the characteristics of both *intentionality* and *change*. Deleuze (2003: 84) also uses the term in relation to Francis Bacon's use of colour, to describe an intentional change of relationship. Steven Goodman (2009:

xiv, xvi, xix) uses *modulation* in a similar sense when talking about the relationship between sound, affect and vibration.



Figure 1: Screenshot from *Autoscopia* by Justin Clemens, Christopher Dodds, Adam Nash, 2009-present: generated portrait of Adam Nash. Image and permissions provided by Adam Nash.

There are other words that can be used to describe the process of conversion to and from, and transformations performed by, digital data (en/decoding, conversion, transduction, etc). However, I prefer *modulation* precisely because it maintains an overtone of change. This overtone facilitates a constant challenge to the often unexamined assumption that digital data is somehow ontologically endowed with the special power to make exact copies of anything, that to digitise something is to somehow capture it free of interference from the capturing medium. In fact, the digitising of anything involves a complex series of protocol negotiations and these negotiations create an excess of data. This excess of data is a new object created in excess of the object being digitised, comprising the data from which a simulation of its semantic source may be constructed, a set of data about the data, and the object created by the synthesis of these two sets of data plus the new object's knowledge of itself. Goodman (2009: 121) also acknowledges the excess created through digitisation, and wonders about the implications for affect in such an excess.

Assemblages involving digitisation are also constantly and recursively deepened. As just mentioned, each step in digital processes relies on a protocol pre-agreed (usually by humans). These protocols determine how to proceed. References to these protocols and minimal descriptions of the nature of the data's semantic source constitute some of the excess constantly created within processes of digitization. However, it is important to note that a digital file does not usually contain instructions on how to decode it in order to reconstruct a copy of its semantic source. Rather, digital files simply note which protocols are required to do so, in order that the system can employ the appropriate software to attempt a decoding. Such software is itself subject to the same process and so on. The point is that digital data is essentially formless and plastic. It requires an intentionality [2] external to itself in order to be reconstituted as a copy of its semantic source. This is why I use the terms *modulation*, *demodulation*, and *remodulation*, to keep in mind the intentional and transformative nature of the operations performed on, within and by digital data.



Figure 2: Screenshot from *Autoscopy* by Justin Clemens, Christopher Dodds, Adam Nash, 2009-present: generated portrait of Marilyn Monroe. Image and permissions provided by Adam Nash.

In this article, I am specifically interested in the modulation process that occurs between *data-as-data* and *data-as-display*. Here, *display* does not necessarily mean *visual display*, but, rather, any mode by which the data can be perceived, which may be visual, aural, textual, physical, relational, whatever. Such display may not be restricted to human perception, which I will discuss later. When it comes to display, modulation is a constantly occurring, crucial interaction that, at least to some degree, defines the nature of perceptions and therefore the work done in and through the medium with regard to display. Yet, here

as elsewhere, at the level of data, modulation is a process that effaces its own input. This provokes further questions. What is the ontological status of data in such contexts? What are the consequences of this constant modulation from one register to another, within data, and through data of non-digital material events such as display? What is the status of artworks produced within such a medium? How does data modulation influence the nature of the interactions and perceptions, or the escape and capture of affect?

Virtual environments are post-convergent

In order to reflect adequately on the new affective relations enabled by the modulation and remodulation of digital data, we can try to examine the intrinsic qualities of virtual environments. Firstly, virtual environments can be seen as post-convergent. This term builds on Henry Jenkins' notion of 'convergence', and designates the phase in the development of a new medium when it recognises itself as such, when practitioners begin operating within the medium to explore its intrinsic qualities – as opposed to mere expressions of its content, that is, prior media – to create work that is only possible in the new medium. (Clemens & Nash, 2010; Deleuze & Guattari, 2004: 261; Elias, 2011: 199; Jenkins, 2006: 18) Networked, digital, virtual environments exemplify contemporary post-convergent practice. The art of virtual environments is not simply art that relies on digital technologies. Rather, it is art that intrinsically operates in the excess that is created in the digital medium. This technical excess is also the excess that is necessarily created in the emergence of a new medium. A new medium contains all prior media as content, and thus is convergent. Yet it is also the container, in excess of these contents. The sum that is greater than its parts, and thus is post-convergent. (McLuhan, 2001: 8-9)

One of the problems of understanding virtual environments as post-convergent is vocabulary. Vocabulary is always challenging when discussing any new form of artistic endeavour. At crucial defining moments an unsatisfactory choice arises between retrofitting existing vocabulary at the risk of forcing a genuinely new concept into the expectations created by the existing vocabulary, thereby losing the very novelty whose expression was attempted, or creating neologisms that potentially confuse more than elucidate. This is particularly true of the term 'virtual', since it is used differently in mainstream culture, media studies, affect theory and philosophy. The current casual mainstream usage, meaning some kind of affect-producing interaction that takes place on the digital network, reflects a growing acceptance of reality as comprising a symbiotic combination of online and material experience - an acceptance that has perhaps always existed, even if implicitly, but is brought into explicit focus by the growth of digital networks as a significant cultural force. As Larissa Hjorth (2011: 65) says, as 'the internet has developed to become an integral part of everyday life globally, the online has evolved into a complex set of networks and communities that have challenged traditional notions of online/offline relations.'

In media studies, the term 'virtual' is sometimes (mistakenly) seen as part of a discussion that took place in the 1990s and is therefore somewhat old-hat for contemporary debates. This is more indicative of contemporary media studies' habit of mistaking the naming of something for the understanding of something, than an indication of the usefulness of the term. The vocabulary is further confused in media studies through the apparent conflation – or at least confused use – of two ostensibly very different concepts: 'virtual' as in 'virtual reality' and 'virtual' as in Gilles Deleuze's use of the term. Deleuze's 'virtual' is an important, nuanced and multifarious concept that is not easily reducible to a single definition, especially given Deleuze's use of the term in different situations over the course of his career. However, we can crudely characterise Deleuze's 'virtual' as being 'the characteristic state of Ideas' (2004: 263), where 'an Idea is a "complex theme", an internal multiplicity - in other words, a system of multiple, non-localisable connections between differential elements which is incarnated in real relations and actual terms.' (2004: 231) Deleuze's term is strongly informed by Bergson's intuitionism, and as such is often mistakenly taken to simply mean 'possible'. However, Deleuze is very clear on the distinction between the possible and the virtual: '[t]he possible is opposed to the real... [b]y contrast, the virtual is not opposed to the real; it possesses a full reality by itself... [w]hat difference can there be between the existent and the non-existent if the non-existent is already possible[?]' (2004: 263) Cleared of this confusion of the possible and the virtual, Deleuze's virtual can offer interesting insights into how affective experiences can emerge in the digital (or at all), and Anna Munster (2006: 92) has convincingly shown that 'one of the wider aesthetic implications of processes of digitization has been to impinge upon and give a certain form to manifestations of the virtual.' Furthermore, in one of the key texts of affect theory, *Parables for the Virtual*, Brian Massumi (2002: 35) locates affect precisely in the two-sided 'simultaneous participation of the virtual in the actual and the actual in the virtual.'

As for the 90s usage of the term 'virtual reality', it was a contemporaneously useful term to capture what was a novel expression of the intersection of material and conceptual reality (or, of data-as-display and data-as-data), heavily informed by the cyberpunk fiction of William Gibson, Neal Stephenson and other authors. (Hjorth, 2011: 65; Pesce, 1995) The term can retrospectively be seen as reflecting and reacting to the virtualisation of capital that occurred in the 1980s, as capital was brought into digital networks. (Attali, 2009: 86) Simultaneously fascinated and repulsed by the implications of this virtualisation, these authors – and subsequently mainstream media – experimented thoughtfully with dematerialisation and the nature of the symbiotic affect system that virtualisation implied (I see this as "symbiotic" in the mutual dependence of data and the non-digital). As I said above, mainstream media simplified the term (dropping the "reality") so that it became a signifier for any interaction that is facilitated on a digital network and induces affect in the material world, or vice versa. Much of this usage also has roots in an arguably religious reading of virtuality. (Wertheim, 1999: 20). Yet as the lived experience of the nexus between material and virtual reality has become more common in contemporary society,

the term “virtual” has come to designate something closer to Deleuze’s virtual, that is, it describes one part of a relation between the virtual and actual. Put differently, this can be characterized as what Anna Munster (2006: 90) calls ‘a differentiated continuum of force and materiality.’

To quickly discuss another relevant term, I suggest that ‘digital art’ is, at this juncture, not a useful definition for the artworks I am describing, because the term has been co-opted by pre-digital art forms to designate simply a tool in the creation of existing artforms. In fact, this is the colonising nature of all artforms, since they are incapable of conceiving of a world that is not contained within their parameters. Naturally, this colonisation results in a new assemblage where the existing artform operates in dialogue with the newly adopted digital tools, creating a kind of simulated version of the artform. This retroactively uncovers previously unknown potentials and tendencies of that artform. Nonetheless, the existing artform’s intention remains the absorption of digital data into its established value structure. For example, in the digital medium, an *oscillator* is just another object defined, analogically, by its intended behaviour, as is a *channel*, and there are an infinite number of them available, neither more nor less important than a triangle, a colour, human input or a set of stock market data. Therefore, to talk of ‘multiple oscillators’ or ‘two channel



Figure 3: Screenshot from *Autoscopia* by Justin Clemens, Christopher Dodds, Adam Nash, 2009-present: generated portrait of Albert Einstein. Image and permissions provided by Adam Nash.

dvd' is meaningless except as an obfuscatory device to establish the authority of the artist. Such a device relies on pre-digital notions of restricted access to means of production and distribution as a method for establishing uncontested value, entirely rooted in an artificial rarity model unrelated to the work itself. It is in order to avoid this absorption of digital data into the value structures of pre-digital artforms that I use the term 'virtual art'. This refers to art that intrinsically uses digital data as its medium, but in the sense that digital modulation allows for Munster's 'differentiated continuum of force and materiality.'

Ontology of Digital Data



Figure 4: Screenshot from *Autosopia* by Justin Clemens, Christopher Dodds, Adam Nash, 2009-present: generated portrait of Barack Obama. Image and permissions provided by Adam Nash.

When you give people too much information, they instantly resort to pattern recognition to structure the experience. The work of the artist is to find patterns. - Marshall McLuhan (Coupland, 2009)

Digital data is formless, plastic and leveling. Stored as binary bits, it has no form as such. As Justin Clemens and I have written (2010), 'Data is data. Data is absolutely not a phenomenological thing. It cannot be experienced as such, like Aristotelian prime matter. Unlike Aristotelian prime matter, however, we can manipulate data with ease.' The fundamentally plastic nature of digital data is what allows us to manipulate it, but until we do manipulate it – until we *modulate* it into some kind of display register – any set of digital data is indistinguishable from any other set of digital data, until modulated into a display register, and this is the *leveling* nature of digital data. All information is reduced to an indistinguishable set of binary bits. To illustrate this, consider a digital image, such as may have been taken by a digital camera of a material scene. Once this visual information is stored as digital data, it can then be opened in, for example, a sound editing program and played as sound. It could equally be used as input to determine a height-map in a realtime 3D environment. The point is that once it is stored as digital data, it loses any determining connection with its semantic source. Therefore, as I said above, parameters must be rigorously established that govern how any given digital data is de- and re-modulated. The notion of protocols or standardised processes that abound in the contemporary technical sphere (such as govern the internet, image compression, audio reproduction and so on) are expressions of this codification of parameters – both sides of a modulation exchange agree to adhere to a set of parameters in order that the intended result is achieved. Naturally, once protocols are required, questions of intentionality, ideology and cultural convention arise.

In this way, the decision to remodulate the data into a display register that somehow resembles its semantic source (for example, to display the data from the digital camera image as an image) can be considered a creative act, an intentional act of representation. While the digital camera example may be conceptually straightforward, consider the case of using motion capture data to drive the animation of a humanoid figure in a realtime 3D environment. It is simply not possible to *recreate*, in a virtual environment, the movements of a human in material space, therefore intentional decisions must be made as to how best to simulate the appearance of human movement. It is sometimes easy to forget that simulations (such as are to be seen everywhere these days – weather simulations, physics simulations, market simulations, etc) are actually simplified representations, because modulation is necessarily modulation into another register, a register in which the originating source does not exist.

Further, virtual environments may be composed entirely of digital data. That is, the entities that constitute a virtual work may themselves originate from within the virtual environment without reference to an associated entity in the material world. They are composed of data and have their provenance in data. In other words, virtual environments can be data mined for input back into themselves. Such intrinsically virtual entities raise interesting questions. They are purely data-as-data and there may be no protocol, or social convention, that

might determine how to modulate them into display. In this context, the establishment of parameter frameworks reveals itself as one of the fundamental process, or acts, that the artist must engage with when creating virtual environments. Such a process requires a conscious acknowledgement of the difference between data-as-data and data-as-display. Can the site of modulation between data-as-data and data-as-display be seen as a site for the emergence of affect, a site where entities defined by their potential for interaction may partially capture, and witness the escape of, affect? By investigating this site of modulation in such a manner, connections are opened with the concept of biomedica, seen from the perspective of affect theory. Eugene Thacker, who coined the term biomedica as the title of his 2004 book, says in a 2010 essay, also entitled Biomedica (123), that “with biomedica, we do not have a split between biology and information, life and code, nature and artifice”. He goes on to say (2010: 126) that “[b]iomedica present a view not merely of biological life as information, but of biological life that is life precisely because it is information.”

The work *Autoscopia* was a collaboration between myself, Christopher Dodds and Justin Clemens, commissioned by the National Portrait Gallery of Australia for their Doppelganger exhibition in 2009. *Autoscopia* was an attempt to explore the affective cycle established between the material and the networked self. The work creates search-based composite portraits, allowing users to enter names in order to create virtual portraits based on internet searches. Both the image and text components of these portraits are composited from the results of web-based searches on the inputted name. The searches exploit the usual sources like Google, Facebook, Twitter, LinkedIn, and so on, as well as more insidiously invasive (but nonetheless publicly available) search engines specializing in background checks and public record searches. The results manifest as web pages containing the dynamically composited image and text, as well as audiovisual sculptures dynamically generated in Second Life. The Second Life component closed at the end of 2010, but the web portraits continue to grow, all the while ‘tweeting’ their existence on Twitter, recursively feeding themselves back into the results of future searches. The work has been continuously running online long enough now that Google will actually return the *Autoscopia* page for certain names as the top ranking result. Within the virtual environment of the world wide web, this represents an emergent privileging of the affective power of digital entities over the material entities (that is, people) that putatively caused the existence of the digital entity in the first place. In other words, the trace left by the digital entity may have more power, in the virtual world, than the trace of its associated material entity. This raises very interesting questions about the nature of the affective power and instrumentality of the trace of immanently digital entities, that is, entities that do not have an associated material entity or entities that emerge from an associated material entity but take on contingent agencies immanent to the virtual environment. I will discuss this later in relation to my work *One, Another*.

Autoscopia also brings into relief the process of modulation between data-as-data and data-as-display. Data-as-data is mined by Autoscopia from all over the internet. This 'mining' involves a constant process of modulating the data-as-data into data-as-display, not according to the original semantic intentions that led to the creation of that specific set of data-as-data, but according to the framework of parameters that can be said to constitute the artwork of Autoscopia. This modulated and remodulated data is then stored by Autoscopia as data-as-data ready to be modulated into data-as-display, contingently upon interaction with an end-user.

Affect and digital data

My notion would be, that anything which possesses any sort of power to affect another, or to be affected by another, if only for a single moment, however trifling the cause and however slight the effect, has real existence; and I hold that the definition of being is simply power. – Plato, Sophist, 247e

According to Deleuze (1988: 124-126), if we take a Spinozan view of affect, then we do not need to be concerned with the difference between nature and artifice, and can concentrate only on bodies' capacities for affecting and being affected, defined by their 'compositions of relations.' For Spinoza, a body can be anything that is capable of affecting or being affected, and he is concerned with an immanent plane of specific encounters, in opposition to a transcendent, anthropocentric morality. Deleuze says that 'a body can be anything; it can be an animal, a body of sounds, a mind or an idea.' Highlighting the musical implications of the word *composition*, Deleuze goes on to portray Spinoza's *Ethics* as both describing and itself constituting a musical composition (Deleuze, 1988: 127). This is obviously going to appeal to me as an artist working with digital code, especially an artist with a background in performance and composition, because it allows us to examine the affective abilities of emergent digital entities – on each other, on their virtual world, and on human interactors. It also allows us to consider the assemblage established between virtual and material worlds as a world (or composition) itself. Not only that, but since I also believe that music/sound practice in the 20th century offers some useful approaches for artists working with the medium of digital data, it is very useful to consider the affective world (or 'the plane of immanence') in terms of musical composition (Deleuze, 1988: 128).

Some contemporary affect theorists define affect as autonomous from consciousness, language and emotion (Clough, 2010: 209). Emotional response is subsequently seen as a retroactive narration of affective response. Massumi, for example, says that affect is pre-

individual and pertains to a different order than emotion, and that affect can be extended to 'any or every level, providing that the uniqueness of its functioning on that level is taken into account.' (Massumi, 2002: 27-37) Other critics have highlighted a potential paradoxical return, inherent in these claims, to a mind/body dualism that would run counter to the Spinozan monism that was supposed to have prompted the claims in the first place (Leys, 2011: 434-472). However, as an artist working in the medium of digital data, it is useful to be able to examine the affective power of digital entities separately from the emotional response it may elicit in human users of the work, and then to consider the ways in which these separate phenomena knit together to form a complex feedback system that constitutes a virtual artwork in its interaction. Such a system may then be examined for its emergent ability to constitute a site for the capture and escape of affect. As an artist, this approach makes sense to me, allowing a study of compositional relations, not forms, and the traces that emerge.

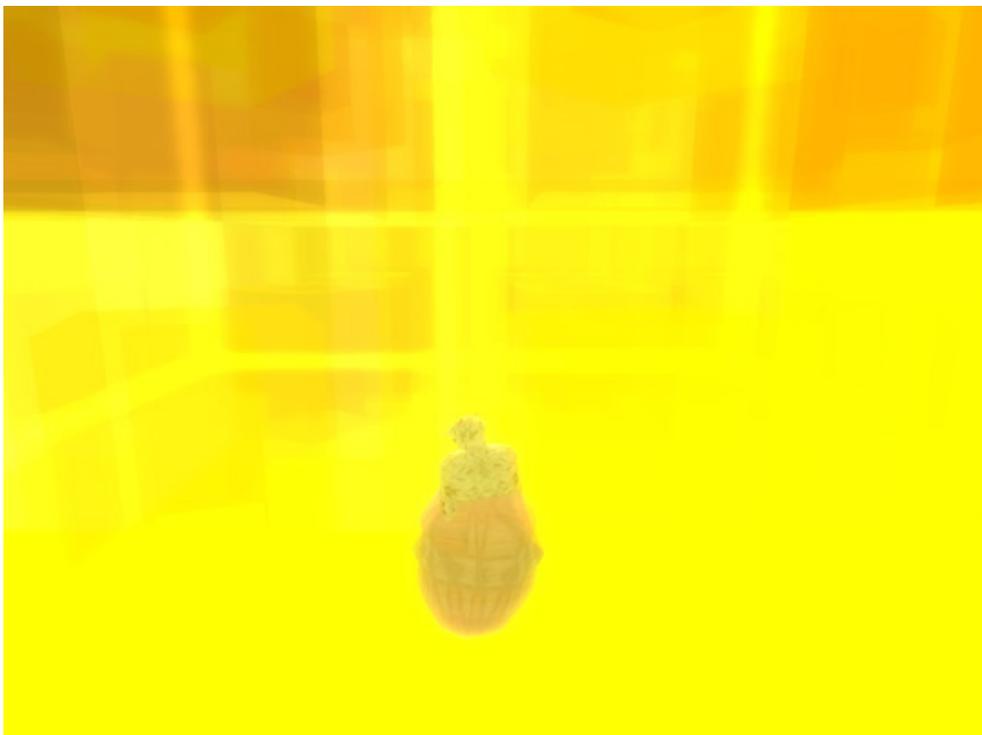


Figure 5: Screenshot from *Trace Aureity* by Adam Nash, 2008, commissioned by Networked Music Review for Turbulence. Image and permissions provided by Adam Nash.

My work *Trace Aureity*, a work in *Second Life*, attempts to examine the nature and potential of such traces by establishing a network of relationships between the user and the environment, not only by investing the virtual space itself with interactive audiovisual properties, but also by spawning moving digital agents in order that different traces are inscribed within the environment by the users' interaction with it (Nash, 2008). I have already stressed that one of the intrinsic features of virtual artwork is its capacity to create entities that originate in

the virtual environment, and are composed entirely of data. *Trace Aureity* explores the affective and relational possibilities this opens up. The digital agents within the work are spawned in response to user proximity, but once spawned, begin to automatically determine and enact paths through the work. These agents have the same interactive effect on the work as the user, that is, an agent moving through any particular element of the work will cause that element to react in the same way it would were the user to move through it, since at the level of digital data there is no meaningful distinction between them. In this way, the trace that the user inscribes within the space of the work becomes a branching one, and somewhat autonomically aleatoric. This trace always maintains a relationship with the user's path through the work, because agents will only be spawned from the user's position. Yet this initially strong relationship between the user's and the agent's paths becomes weaker over time as the agent gains greater degrees of autonomy from its provenance. At the same time, since the agents always spawn initially in response to the user's movements, a non-linear network of relationships is established, in which the semi-autonomous behaviour of the agents can never be said to be completely independent of the user. In other words, it is always the user that is playing the work (even if not totally in control of the work). In this way, *Trace Aureity* can be seen as an example of a multi-sited, or non-linear, avatar that transcends the linear mapping between human user and the user's humanoid avatar. The work thus represents an attempt at transcending the human-avatar metaphor. The user is invited to navigate the work in a reflective manner, to experience as many sites of interactive relationship as possible, to play the space in a virtuosic sense as a result of removing all tendencies toward a forward or linear navigation or interaction model. For the games scholar Bernadette Flynn, this kind of reflective, or contemplative, navigation represents a 'central organizing device' through which the agency of the user 'enables the experience of profound ideas and different modes of consciousness.' [39] Of course, it is important to remember that the register of such experience arises after the pre-individual fact of the autonomic establishment of an affect cycle and represents what Massumi (2002: 35) identifies as the 'capture and closure of affect.'

In *Trace Aureity*, there is an implicit expectation that the user will exercise their virtuosic ability to navigate the work, manipulating the various possibilities inherent in the viewpoint, or 'camera', of the interface of the RT3D MUVE, allowing a conscious experimentation with different modes of what is essentially a distributed avatar. In line with Flynn's ideas, the work rewards a reflective or contemplative navigation of the visual, spatial and sonic elements of the work, becoming familiar with audiovisual patterns that emerge from the coded virtual spaces that constitute the work; sound, vision and space all meld into a symbiotic compositional relation with the user such that they are indistinguishable as discrete media elements, evidencing the post-convergent nature of the work. By experimenting in this virtuosic manner, the user and the work enter a new relationship that is closer in spirit to the relationship between two performers than that of the relationship between artwork and user. In this way, *Trace Aureity* represents an investigation of non-

linear data flow in virtuosic artist/user interactive relationships, an audiovisual composition of relations along the lines of Deleuze's (1988: 123) 'composition of speeds and slownesses on a plane of immanence.'

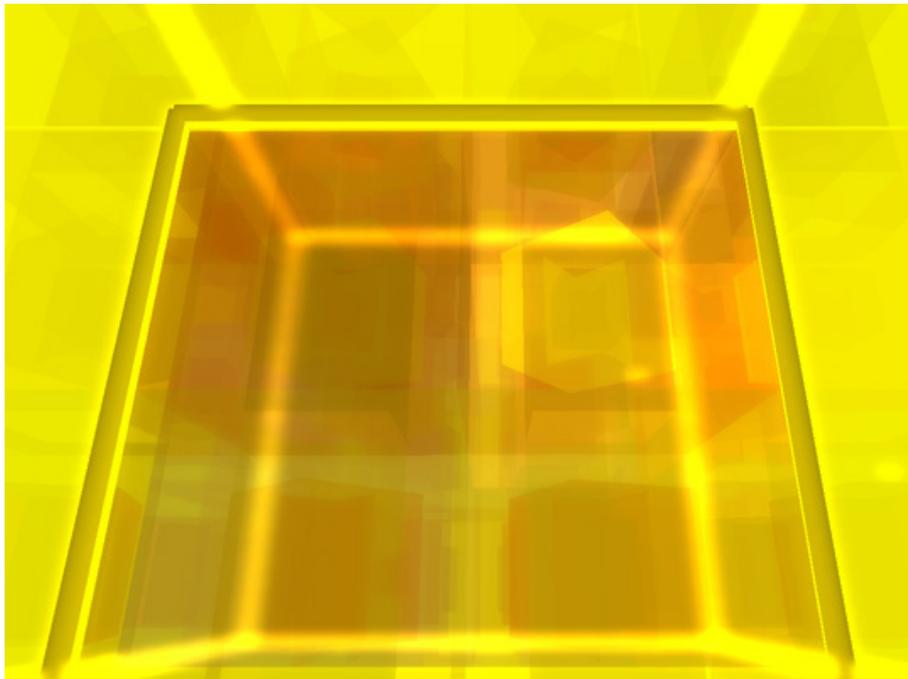


Figure 6: Screenshot from *Trace Aureity* by Adam Nash, 2008, commissioned by Networked Music Review for Turbulence. Image and permissions provided by Adam Nash.

Trace Aureity enacts the modulation from data-as-data to data-as-display as its very work. In the state of data-as-data, the work does not exist except as an undifferentiated set of digital data. When this data is modulated into the state of data-as-display, it is modulated into patterns (colour, sound, shape, movement) and relationships (spatial, interactive) that may be retroactively narrativised by the user. Only then can it be said to exist. User engagement with the work facilitates this modulation, specific to moments in time, into data-as-display. There are both contingent selection, and autonomic engagements, within parameter frameworks, that produce specific colours, sounds, shapes, movements and interactions. These expressions are unique to that specific interaction and can never be exactly repeated, due to the autonomy given to the generated digital entities in modulating from data to display.

Once such a set of relations as those between artist, work and user in *Trace Aureity* have been composed, new potentials for intimate or sensual engagement can be explored. This

is another of the intrinsic qualities of virtual art – its site of interaction can be very intimate. Removed from physical staging or curation, such as in an art gallery or a concert hall or a nightclub, the interactor is often interacting with a virtual work while they are physically alone or in a place that is familiar, a private space. This is the kind of space that perhaps parallels that suggested by Erik Davis' (1997) sensual reading of McLuhan's concept of 'acoustic space.'

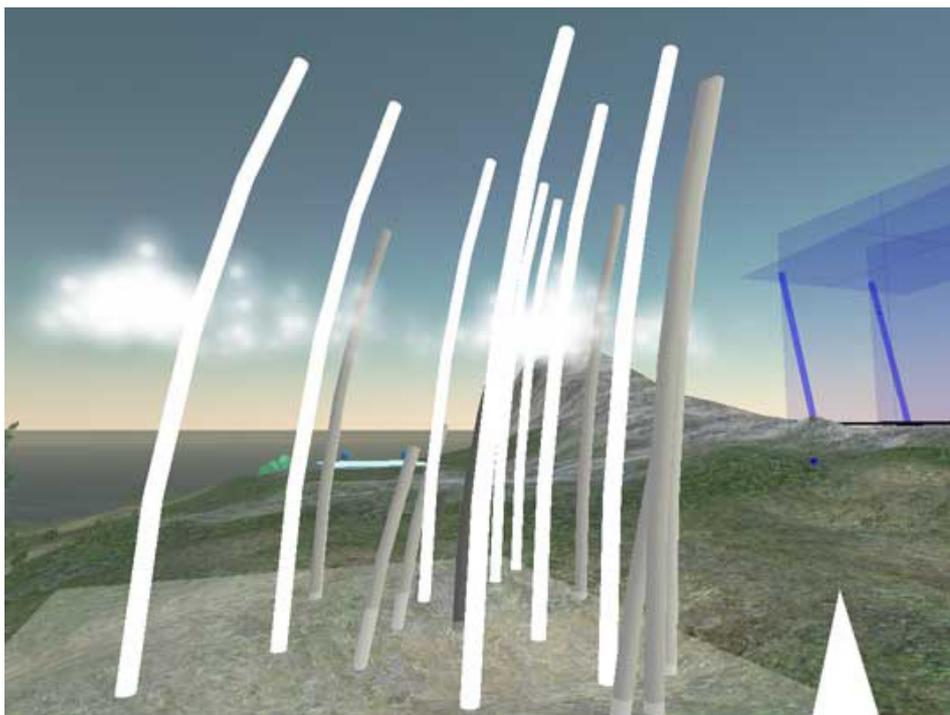


Figure 7: Screenshot from *Moaning Columns of Longing (Unsung Song #7)* by Adam Nash, 2007-2009. Image and permissions provided by Adam Nash.

Two other works of mine attempt to explore this relation in two different ways. First, *The Moaning Columns of Longing* (Nash, 2007) explicitly explores the nature of our emotional reaction to virtual experience. Staged in Second Life, the work enacts emotional and sensual blackmail. In doing so, it consciously exploits the user's understanding of the spatial and material analogies used to interface with the environment. This creates a technically mediated experience of emotion/affect that is aware of its own excess. When a user's avatar approaches the work, a virtual 'column' is spawned, glowing white and spurting glittering particles of joy while it declares its undying, faithful love for the user via the 'chat' facility built into the interface. Once the user leaves the space (that is, logs out), the column starts sending more and more emotionally manipulative emails begging the user to return. Every hour that the user does not return to 'touch' the column ('touch' is the Second Life interface

analogy used instead of 'mouse click'), the column becomes a little duller, a little shorter, and starts emitting a moaning sound that becomes louder as the hours pass. The hourly emails become more desperate and more emotionally demanding ("without you, I will die"). If the user does not return within 24 hours, the column will 'die', that is, in technical terms it will be deleted from the database permanently. If the user does return to 'touch' the column within 24 hours, the column returns to its full height, glowing brightly and rejoicing loudly over the chat channels, "[username] loves me! My existence has meaning!". Over the couple of years this work was in operation, some users maintained their columns for months at a time. During this time, these users returned to their column at least once every 24 hours, and received an email from their column every single hour for the entire time their column was 'alive'. This nuanced composition of technologically mediated emotional exchange between the virtual and material calls into question the instrumentality of not only the technological interaction itself, but also the very means by which such an interaction can take place and the affective relationship between love and technology. It also amply illustrates the process of modulation from data-as-data to data-as-display and the complicity of the user in such a modulation. Until the user activates the work (both technically by logging in and conceptually by accepting the display parameters such as 'touch', 'visit', 'love,' etc), it is nothing more than a set of undifferentiated, plastic, digital data. Upon activation, the data-as-data is modulated, via a computational parameter framework, into data-as-display (sound, vision, words, emotions), the only mode by which it is really possible for a person to interact with the work.



Figure 8: Screenshot from *One, Another* by Adam Nash, 2009.
Image and permissions provided by Adam Nash.

The other work I want to discuss in this light, my work *One, Another* (Nash, 2009), also staged in *Second Life*, explored a combination of the concerns of both *Trace Aureity* and *The Moaning Columns of Longing*. Composed of a large flat platform of pink tiles, each tile chose its own saturation of pink based on its proximity to the centre, or heart, of the composition. Users could either wander around within the platform, triggering virtual entities programmed with very simple parameters, or simply wait for the virtual entities to emerge of their own "volition". These entities would themselves "wander around" constantly seeking to connect with other entities but always failing to do so since they were not programmed with the parameters that would allow them to understand such connections. Any movement, whether by a user's avatar or by a virtual entity, caused multi-sited ripples of affect throughout the work. Based upon Lacanian (Zizek, 2008: 66-67) concepts of lack and Julia Kristeva's (2002: 178) subsequent sophisticated notion that 'imagination is a discourse of transference – of love,' feedback loops of interactions created complex audiovisual assemblages that would sometimes resonate for hours after the user had left. This work raises interesting questions about the causality and trace of affect, and the relationship between data modulation and affect. The display will not occur unless there is a user logged in, and yet the operations on the data continue. Once the user logs back into the environment, these operations are displayed as if they have actually occurred, and in this sense they can only retroactively be said to have occurred. Accordingly, the relationship between the modulation of data (between data-as-data and data-as-display) and the autonomy of affect are highlighted. Massumi says that "[a]ffect is the *virtual as point of view*" (emphasis in the original). It may be clearly seen in the artwork *One, Another* that the modulation from data-as-data to data-as-display is a kind of technical enactment of the virtual as point of view. At the same time, Massumi is right to caution against taking the visual metaphor too seriously, since affect - like data-as-data - is plastic and formless, until contingently specified. Specification (or modulation according to a parameter framework) may occur in or across any sensual mode, regardless of the ability to perceive of the participating bodies. (Massumi, 2002: 35) This is not to suggest a simple concordance between digital data and the virtual. Rather it is an attempt to identify the virtual aspects of a site where pre-individual affect meets interactive bodies that participate in both affect's capture and escape.

Conclusion

By working in the medium of digital data, these artworks raise numerous questions about the relation between the virtual and affect. Amongst them are the following: Is it the case, as Stephen Wolfram suggests, that this kind of complex generation of virtual/actual form through the interaction of very simple rules is constitutive of life itself? And, if so, what are the implications of this for the universality of affect? Can an immanently digital affect cycle be said to exist? (Chaitin, 1999: 108-109; Chaitin, 1998: 85) Brian Massumi (1995: 96) has

suggested that 'the measure of a living thing's potential interaction is its ability to transform the effects of one sensory mode into those of another'. If we accept this, connections are raised between the questions I have discussed in this paper about the nature of data-as-data and its modulation into data-as-display, along with the plexus of affective compositional relations that evolve in the convergence of virtual and material spheres. Can we therefore identify a relationship between what I have identified as the excess created by digitisation and the excess of affect as identified by Massumi and Guattari? (Bertelsen & Murphie, 2010: 153) If so, then it would seem that the ostensibly different uses of the term 'virtual' - in its Deleuzian sense, in Massumi's affect-as-virtual sense and in the sense of the virtual as cyberspace or networked digital data - may in fact be closely related, and such a relationship still needs to be rigorously explored. Similarly, since the implications of biomediatric readings of affect theory can be actualised or experienced in the interaction between the material and virtual, what exploratory invitations does this open for artists working in virtual environments?

These questions are current and pressing, and any answers are likely to be emergent and contingent. Part of the point of my ongoing virtual art practice is to attempt to propose questions that may be appropriate to our new situation. To this end, long-term collaborator John McCormick and I are currently working on *Reproduction*. (McCormick & Nash, 2010)



Figure 9: *Reproduction* by John McCormick and Adam Nash, at Screen Space Gallery, Melbourne, Australia, 2011. Image and permissions provided by Adam Nash.

Reproduction is an evolving virtual environment of artificial audiovisual entities that exist in a symbiotic relationship with humans. In a physical gallery space, visitors spawn and manipulate entities via motion capture, while online users spawn and interact with entities through social networks – Facebook updates, tweets etc – and a custom web based interface. Because it's a symbiotic relationship, the artificial entities are not simply linear dependents on the actions of humans. Rather they evolve and grow according to the parameters of their ecosystem, which itself emerges from the agency of the entities. Many of these parameters are influenced by the (physical and virtual) actions of humans, and the artificial entities attempt to learn and anticipate human actions. Humans equally attempt to learn and anticipate the behaviors and reactions of the artificial entities. The result is a complex assemblage of human and virtual life that evolves and learns from its own participants. Virtuoso human users of the system (for example, dancers, musicians, gamers, or any person who is willing to spend the time) are able to engage in improvisatory performances with the artificial entities, where the artificial entities are making performative decisions of equal influence to human decisions within the performance, with human and digital entities responding to each other's actions. Casual visitors to the gallery are able to engage with the artificial life environment in a contemplative navigation based on movement in physical space. Online users of the work are able to engage in a more subtle and nuanced manner, entering into long- and short-term relationships with digital entities, who become 'friends' in both the social networking and material sense, influencing each other's behaviour.

The work questions the nature of our virtual society by extending emerging social network practices. Is a 'friend' really a friend? What manner of my 'self' is my online self? How much agency do these selves have and how do these multiple selves interact with each other and others? What is the nature of the affect facilitated in such a composition of relations? In this paper, I have attempted to show that virtual art raises new questions both about the nature of affect and relation, and about the ontology of digital data. Virtual art, I have suggested, enables us to more adequately reconfigure the concepts with which we approach data, in terms of its ontological status, because it foregrounds the key role played by modulation, and in the instability of the protocols that interpret data. I have also shown, through an exploration of my own art practice, that virtual art enables us to grasp the new kinds of affect opened up by the digital regime.

Biographical Note

Adam Nash is internationally recognized as one of the most influential artists working in virtual environments. His work has been presented in galleries, festivals and online in Australia, Europe, Asia and the Americas, including peak festivals SIGGRAPH, ISEA, ZERO1SJ and the Venice Biennale. He was the recipient of the inaugural Australia Council Second Life Artist in Residence grant. He was awarded an Ars Electronica FutureLab residency in 2009. He was awarded an Australia Council Connections Residency in 2009, for which he founded SquareTangle with colleague John McCormick. He founded the Australian Centre for Virtual Art with Christopher Dodds, which runs labs and workshops for existing and emerging artists to explore virtual media. He was shortlisted for the National Art Award in New Media at the Queensland Gallery of Modern Art in 2008. He has a PhD in Animation and Interactive Media from the School of Media and Communication at RMIT University, where he is a lecturer in Computer Games and Digital Art.

Notes

[1] Links and documentation concerning the artworks can be found at <http://adamnash.net.au>.

[2] There must be an external protocol to facilitate modulation, protocols are intentional forces designed to facilitate modulation to a specific display state. Even were digital data to begin designing their own protocols they would still need an external, intentional, protocol that determines how they would do that.

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FCJ-149 Affect and Care in *Intimate Transactions*

Lone Bertelsen.

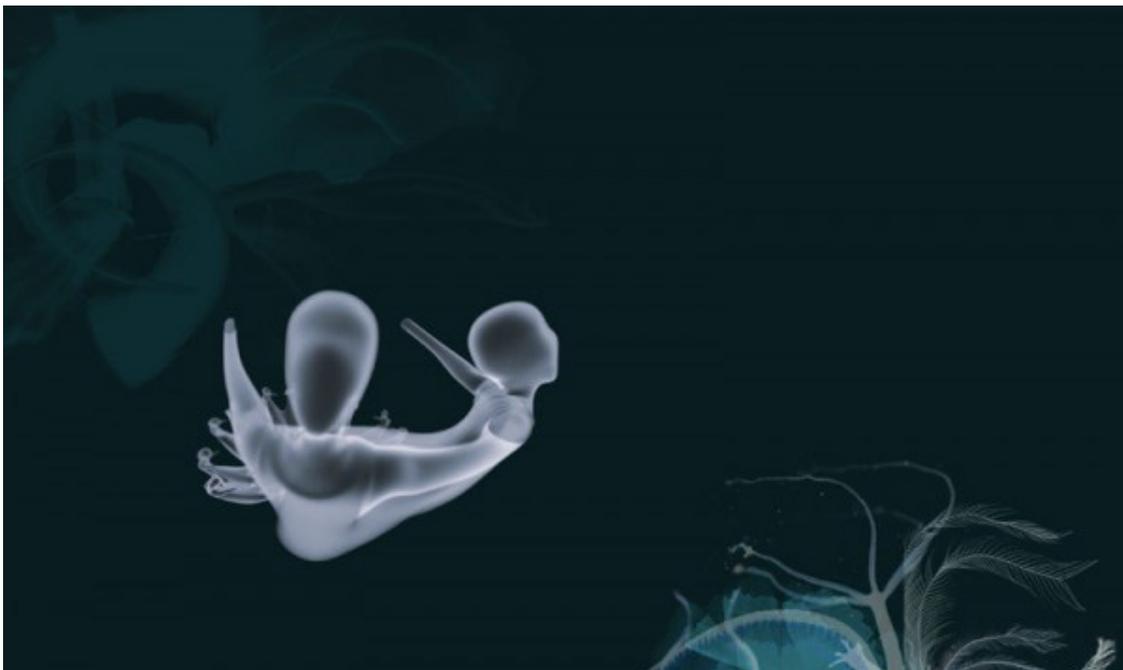


Figure 1: 'Intimate Transactions Book Cover' (see Armstrong, 2006).
Source: <http://www.embodiedmedia.com/>, with permission of Keith

This article considers the 'co-affective' power (Ettinger, 2011: 13) of the new media artwork *Intimate Transactions*. Keith Armstrong (2005), artistic director of the *Transmute Collective*—the creators of *Intimate Transactions*—describes *Intimate Transactions* as collaborative, ecological, and concerned with relation. [1] In its most recent incarnation *Intimate Transactions* takes the form of a 'dual site networked installation'—'two people' participate in the artwork from

'two different locations' (Armstrong, n.d.). In Sydney, where I encountered the work, these locations were the *Performance Space* in Redfern and *Artspace* in Woolloomooloo. [2]

Participants engage with *Intimate Transactions* through active 'full body' movement. Through this, they engage with the animated 'creatures' in the 'virtual environment[s]' on a large screen (Armstrong, 2005; Hamilton and Lavery, 2006: 2). At times it is also possible to collaborate in a networked, 'moving together' with the other person (Massumi in Massumi and Zournazi, 2002: 223). This 'moving together' affects what occurs throughout the entire work.

Ultimately, as Armstrong (2005) states, the aim of *Intimate Transactions* is a collaboration that will 'enrich' both the sensual and screen-environments. The work is not about individual or 'absolute control'. It is not only about 'me' and it is not about winning. Rather, in *Intimate Transactions* there is a complex, and 'intimate', bodily 'energy transfer' between participants. The design of the work encourages participants to move together, with the non-human creatures as well as the other person, in a 'co-creative' (Ettinger, 2006a: 122) collaboration. As such, *Intimate Transactions* as a whole is designed to operate, 'co-creatively' (Armstrong, 2005), at a 'co-affective' level of experience (Ettinger, 2011: 13). In sum, the 'co-affective' activity of *Intimate Transactions* emerges from a larger 'trans-subjective' field (Ettinger, 2006a: 111; Guattari, 1995: 6). This field involves the human participants as well as the non-human screen-creatures.

Here I will explore the restorative powers of the collaborative and *trans-subjective fields* generated by *Intimate Transactions* (see also Armstrong 2006: 33). To do so, this article draws on the work of Bracha Ettinger, Félix Guattari, and Brian Massumi, amongst others. For these thinkers the 'trans-subjective level' of experience—precisely because it is 'co-affective'—holds 'ethical potentiality' (Ettinger, 2006a: 111 and 117). In general, there is a pressing need for explorations of the trans-subjective because such explorations 'may lead us to discover our part of shared responsibility in... events whose source is not "inside" the One-self' (Ettinger, 1995a: 51). As such, the kind of exploration of the trans-subjective found in *Intimate Transactions* could be seen as providing a more embodied way of engaging with the contemporary 'eco-political' situation (Armstrong, 2006: 15). *Intimate Transactions* then is of particular interest because it is a work that aims to activate the 'ethical potentiality' of the trans-subjective more fully than many "interactive" works. [3]

In this article I will first give a detailed description of the trans-subjective qualities of *Intimate Transactions*. As the title of the work suggests, *Intimate Transactions* is designed

to draw attention to, and filter action through, the trans-active (Armstrong 2005; 2006: 25; Birringer, 2006). As such, *Intimate Transactions* deliberately challenges many standard notions of the interactive, and the activities and practices that result from these standard notions (see also Massumi, 2011: 39-86).

The description of the work itself will be followed by a theoretical consideration of the 'co-affective' nature of the artwork's 'transactivity' (Birringer, 2006: 109). In discussing this 'transactivity', Birringer writes that in *Intimate Transactions* '[t]he site of the body is a transactional collectivity; fluid, transitory, ungrounded' (Birringer, 2006: 109). [4] Taking on board Massumi's call for a rethinking of 'interactivity' in affective and 'relational terms' (Massumi, 2011: 52 and 67; see also Fritsch, 2011 and Brunner and Fritsch, 2011), the article considers 'transactivity' from the complementary perspectives of relationality, the trans-subjective, affect and ethics.

As I have already begun to suggest, this 'transactivity' (Birringer, 2006: 109) is different to more conventional notions of the interactive. It is different because, with a focus on the trans-, we move away from thinking "interaction" only as occurring between 'already-constituted' subjects (and objects). In moving toward the trans-subjective, we move to 'the primacy of' affect, relation and of the in-between (Massumi, 2002: 24; 1997a: 175; 2000a and 2011: 39-86).

Following the work of Massumi in particular this article argues for the importance of a 'tending' to this affective level of experience, both in designing "interactive" art—such as *Intimate Transactions*—and in life more generally (Massumi, 2000a: 216; 1997a; 2011; see also Ednie-Brown, 2007). For Pia Ednie-Brown (one of the collaborators on *Intimate Transactions*) the kind of "design ethics" involved here must embrace a 'striving for a balance between affecting and being affected' (Ednie-Brown, 2007: 329). *Intimate Transactions* also makes it clear that to remain ethical and sustainable such tending to the affective level of experience must foster 'diversity' in 'collaboration' and avoid a consumption of difference (Ednie-Brown, 2007: 323; see also Ednie-Brown and Mewburn, 2006).

Trans-subjective Collaboration and a 'Logic of Affect'

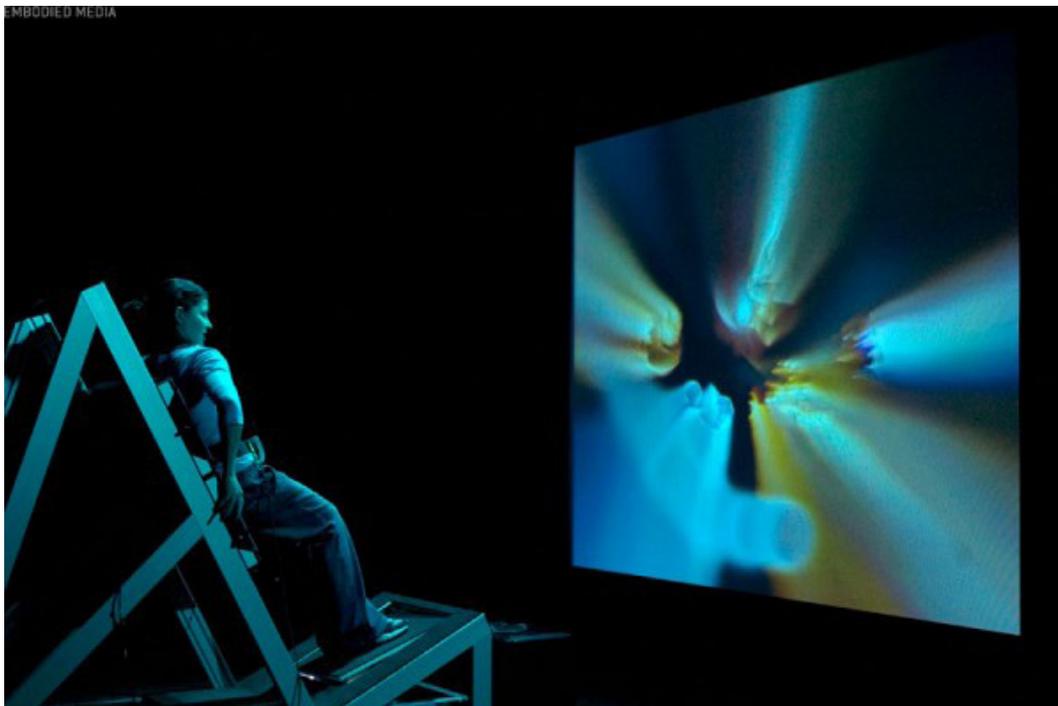


Figure 2: 'Participant navigating'. Image by David McLeod.
Source: <http://www.embodiedmedia.com/>, with permission of
Keith Armstrong

In *Intimate Transactions* two people in different physical locations engage with a large 'screen-space' (Armstrong 2006: 26). In order to engage with the work the participants stand, tilted slightly back on (what the artwork's creators call) 'identical Bodyshelves'. [5] Lisa O'Neill explains that the shelf is comfortable but that its backward tilt puts the participants in a 'slightly unusual position' (O'Neill, 2006: 38). From this tilted position the participants move their entire body, rolling the back and shoulders against the Bodyshelf in order to navigate the world on the screen. They also shift the weight of their bodies on the mobile platform on which they stand (see O'Neill, 2006). Engagement with the world on the screen involves a strange 'dance', more or less on the spot, from which the body-shelf/platform picks up bodily movement (Ednie-Brown, 2007: 244; see also O'Neill, 2006).

The movement on the shelf enables participants to engage with the work and its screen-spaces—the worlds of the non-human creatures (Armstrong, 2006: 26). The movements of the body on the shelf also 'activate' the participants' avatars, which can enter what becomes at times a shared realm in the 'virtual world' (shared simultaneously across the two

screens in the different spaces) (O'Neill: 2006: 36-38). In this 'shared space' the avatars of the two participants can 'meet' and move together as one semi-merged avatar (Armstrong, 2006: 27-28; O'Neill, 2006: 41). Through all this, as Jillian Hamilton explains, the "Bodyshelf" requires whole body movement to activate the motion sensors embedded in the surface. This shifts the participant from a relatively passive wrist/hand interaction with the interface to a physically active, whole body engagement with it' (Hamilton, 2006: 120).

However, the Bodyshelf does not only pick up and transfer the movements of the body on the shelf onto the avatars on the screen. The shelf also plays an active part in the 'immersive sound-scape', as the bodily 'motion in space generate[s] the feedback of the sound' (Webster, 2006: 60 and 67). This is an often intense and unusual sound.

Finally, the Bodyshelf transmits vibrations, based on the other person's movements, onto the lower back of the body. The vibrating devices in the Body-shelf, 'are activated during the "meeting" of the two...avatars, when they become locked together in joint movement' (Ednie-Brown and Mewburn, 2006: 80-81).



Figure 3: the rubber device. Video still. Source: <http://www.embodiedmedia.com/>, with permission of Keith Armstrong

Another aspect of the vibrating quality of the work emerges via a rubbery 'garment' (with a pink border) that is looped around the neck, like a 'pendant', and strapped loosely to the abdomen. Inside this garment there is a device that transmits vibrations onto the stomach of the participants. In this case the vibrations are based on the engagement with the creatures in the 'screen-world' (Ednie-Brown and Mewburn, 2006: 80-81; Armstrong, 2005). These

vibrations on the stomach, together with the vibrations on the lower back, constitute the most intimate qualities of the work. With these vibrations one literally feels the movement of others (see also Hamilton, 2006: 124). Pia Ednie-Brown and Inger Mewburn worked with the *Transmute Collective* in designing these more intimate vibratory components of the work.

The intensity of the sound enhances the experience of intimacy. Guy Webster (sound director of the *Transmute Collective*) explains that '[t]he vibrations in the Bodyshef, and in the pendant...are all controlled by sound'. For Webster this is an important aspect of the 'sound design' because the 'sounds can actually reach out and touch you' (Webster, 2006: 62).

Body, eyes, animated images and creatures, intense sounds and the bodily vibrations are brought into a "co-territorialised" and networked milieu. A partial and distributed subjectivity emerges with this. Armstrong (2005) explains that for both participants the experience is one of transversally engaging with, and feeling the movement of, an excessive if unknown, anonymous body (one does not see the other participant before or during the "interaction"). In fact, it is not *initially* clear whose or even what movement we experience in the vibrations emerging from the 'haptic devices' in the Bodyshef, the 'immersive sound' (produced by bodily movement) and the vibrations felt on the stomach (Armstrong, 2006: 7). Yet, over time, a strong sense of affective 'co-creation' emerges, between the human participants, the non-organic aspects of the work (including the technology), and the non-human creatures on the screens (these screen creatures are described by the artists as 'Force of Change', 'Force of Permanence', 'Force of Instability', 'Force of Conflict', 'Force of Torment' [Lawson and Foley, 2006: 56-58]).

At the same time, it is important to note that in this 'co-creation' the work does not collapse into undifferentiation (see Ednie-Brown and Mewburn, 2006). Even though the experience is indeed 'co-affective', the felt differences between the participants and the screen creatures remain, even as transactions occur. In other words, differences are expressed even during the meeting of bodies and creatures. Rather than mergers, there are encounters via the felt vibrations, the visuals and the sound (Armstrong, 2006: 33 and Webster, 2006: 69). I will shortly discuss the precise moment at which these encounters take an ethical turn (encouraging 'relational difference in co-emergence' [Ettinger, 2006b: 72]). In order to discuss this ethical turn, it is first necessary to gain a better understanding of the various environments on the screens.

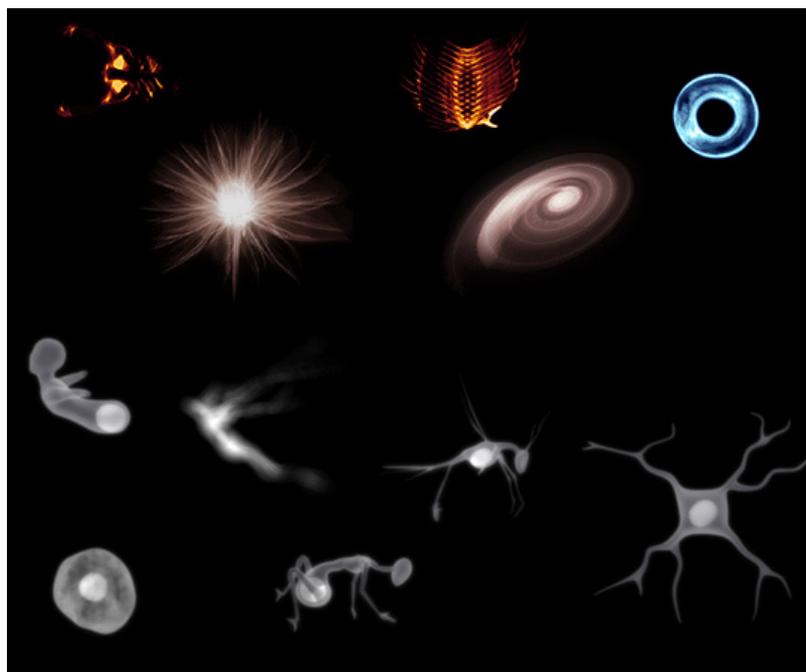


Figure 4: 'Creatures and Sample Internal Images'.

Source: <http://www.embodiedmedia.com/>, with permission of Keith Armstrong

In *Intimate Transactions*, there is a complex layering of different screen-worlds (Armstrong, 2006: 27; Hamilton, 2006: 116). At times, participants, with their own avatars, can engage with the more "local" screen environments of the non-human creatures (Armstrong, 2005). As mentioned, the various forces of the creatures are expressed in part as vibrations, felt on the stomach when participants engage with them (Ednie-Brown and Mewburn, 2006: 80-81; Webster, 2006: 69). However, even in this phase of the work, the actions of avatars change more than the environments of the creatures. They have effects throughout the system (and each person's avatar is presented as a 'shadow' avatar in the other participant's screen-space [Armstrong, 2005; 2006: 27]). At other times, there is a direct participation in a 'shared space' (Armstrong, 2006: 27-33). Here the avatars reflect the movement of both participants within a shared screen-space. It is in this environment that the separate avatars can meet and move together. [6]

Armstrong (2005) emphasises the importance of the different screen environments. He explains that at one stage of the work it is possible for the individual participants to impoverish the world of the non-human creatures. In these more 'local' spaces the human participants can, individually, take away 'objects from' the non-human creatures in order to take possession of them and 'incorporate...these objects into their own avatars' (Armstrong, 2006: 27). At the beginning of the experience, the participants are told the following:

You can take things away from your Creatures, but in order to return these you must interact with the other person.

How you treat these Creatures will ultimately affect what you see, hear and feel and what the other person sees, hears and feels ... (cited in Armstrong, 2005).

Armstrong points out that it is possible to not 'work collaboratively with the other person'. However, the less one does so, and the more one takes away from the environments of the non-human creatures, the more impoverished the 'immersive' world becomes. The experience becomes tame. It loses its intensity. This loss of intensity is 'indicated by a rapidly increasing, overall sluggishness, lessening brightness and inability to transact smoothly' (Armstrong, 2005). Webster explains that '[a]s the effect moves across the whole spectrum, all the imagery starts to become lethargic and that's directly represented in the sound' as well (Webster, 2006: 66). It is clear then that non-collaboration is not encouraged by the very design of the work.

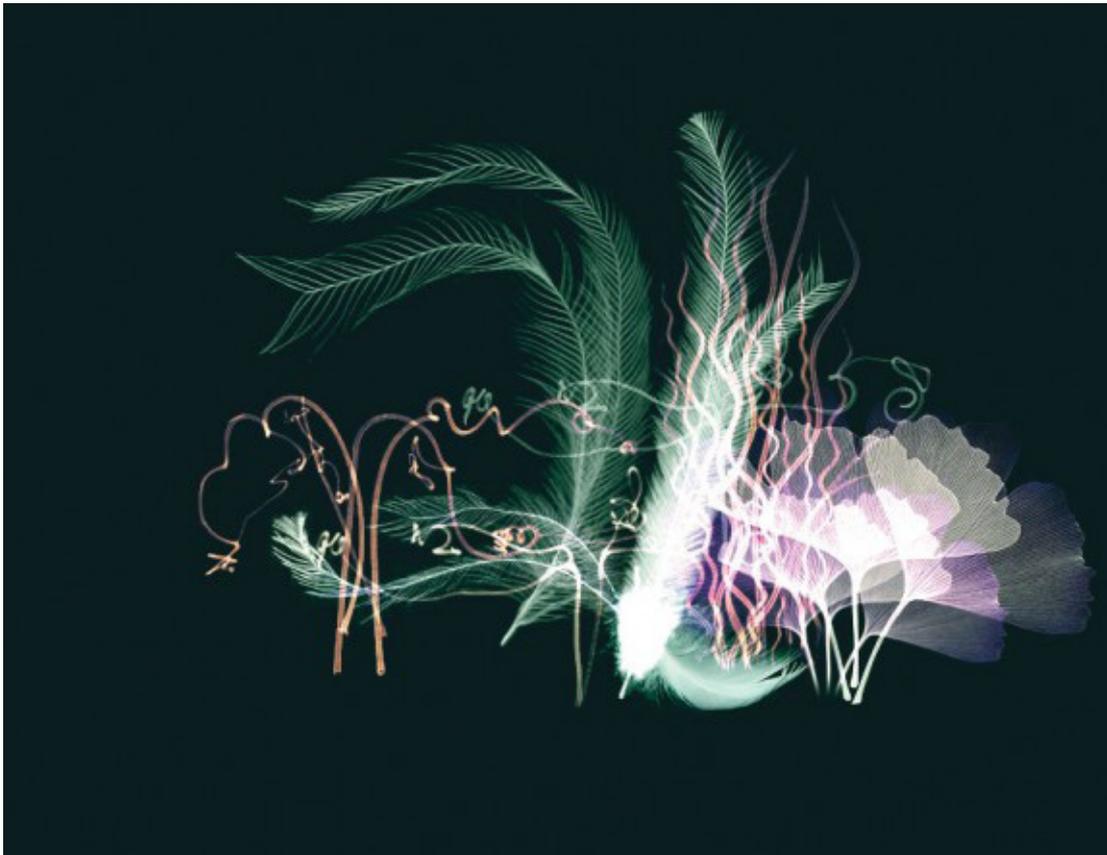


Figure 5: 'Force of Change – Internal Composition' Image by Benedict Foley.
Source: <http://www.embodiedmedia.com/>, with permission of Keith Armstrong

In order to re-“enrich” all the screen-spaces, including the worlds of the non-human creatures, and indeed the gallery spaces, the two human participants have to work together. For one thing, their avatars have to join. They must meet in a ‘trans-subjective’ movement based on what Armstrong (2005) terms transversal, ‘networked and cross-affective processes’. These affective processes are ‘multidirectional’ (Ettinger, 2006b: 64) and, as mentioned, take place in a shared space (Armstrong, 2006: 27). In this shared space participants can work together and move together to heal the creatures and ‘restore’ environments that may have suffered over-‘consumption’ (Armstrong, 2006: 29, 27).



Figure 6: ‘Person to Person Interaction Screen’. Image by Keith Armstrong.
Source: <http://www.embodiedmedia.com/>, with permission of Keith Armstrong

Ecological responsibility here becomes distributed (networked). It emerges from an *affective* (trans-subjective) *field* shared across the two gallery spaces. Together, the vibrations, the ‘immersive sound’ and the whirling in the screen-worlds make the movement of this shared trans-subjective affect felt. Affect here clearly emerges from the activation of ‘our (collective) movements’ (Birringer, 2006: 112). As such, it is in the activation of this collective sphere that *Intimate Transactions* takes on an ethical and restorative turn (see Armstrong, 2005). One aspect of this is that the environments of the non-human creatures can only be re-

energised if the participants actively surrender control, not that they ever have 'absolute control' (Armstrong, 2005). Surrendering control, they can meet in a trans-subjective movement that affects and restores the energy of the entire work. In sum, the participants have to 'cooperate to restore the creatures and the energy of their own/shared environment' (Armstrong, 2006: 29). As noted, Armstrong (2005) refers to this cooperative working process as 'cross-affective'.

Here we can build on Armstrong's idea that much of the "action" in *Intimate Transactions* takes place on a 'cross-affective' level of experience. I am taking this idea of 'cross-affective' "action" a little further, seeing the potential 'co-creative' activity (Ettinger, 2006a: 122; Armstrong, 2005) involved as not only 'cross-affective' but also 'co-affective' (Ettinger, 2011:

13). That is, affect not only crosses between various actions, but arises from within, and even perhaps as, the 'transactivity' involved (Birringer, 2006). This is at the distributed heart of what can be called a 'logic of affects'. Part of the achievement of *Intimate Transactions* is that it so emphatically emphasises an entire 'logic of affects rather than a logic of delimited sets' (Guattari, 1995: 9) [7]. In the latter, the 'logic of delimited sets', a collection of 'discrete elements' (such as participants and technical elements) come first and last, with something like "interaction" occurring, only secondarily, between them (Massumi, 2000a: 191). However, a 'logic of affects' is concerned with trans-subjective, 'pre-personal' and 'collective' fields of experience. A 'logic of affects' is 'polyphonic' (Guattari, 1995: 9 and 1) 'multi-polar', (Guattari, 1996: 158) as well as 'co-creative'. [8] It is precisely because the 'logic of affects' is 'multi-polar' and 'co-creative' that it can be understood to involve 'transactivity' across emergent subjectivities, rather than interaction between 'already-constituted' subjects or objects ('delimited sets') (see Massumi, 1997a: 175; 2011: 39-86). It is the rigorous attempt to design for engagement within the 'logic of affects' that makes *Intimate Transactions* a matter of 'transactivity', more than interactivity (the latter of which can sometimes seem more concerned with the 'logic of delimited sets'). With its focus on 'co-affective' 'transactivity', *Intimate Transactions* thus appears to challenge the more conventional notions of interaction.

Prior to writing about *Intimate Transactions* and 'transactivity' Birringer proposed ways of categorizing 'various types of interactive environments (sensory, immersive, networked and derived environments)'. He explains that '[w]hen the parameters of these are mixed, we speak of mixed reality or hybrid environments'. However, according to Birringer *Intimate Transactions* is different because it involves 'transactivity':

Intimate Transactions is another category, a transactive environment, involving telematic performance with distributed action, where images and sounds are created not simply to be transmitted from one location to another, but to cooperate in an evolving feedback loop via a virtual ecology. (Birringer, 2006: 108-109)

As fits 'a logic of affects', the primary concerns of *Intimate Transactions* are not only relational then but also 'ecological' (see Armstrong, 2005 and 2006). They are ecological in two senses. First there is a focus on ecology understood in terms of the complex dynamics of relations in a given situation, with an emphasis on changing the way that these dynamics are approached/experienced. Second, the design of *Intimate Transactions* fosters the possibility that experiencing the dynamics of this ecological relationality, in this case very intimately within an artwork, may change approaches to more general environmental issues. Armstrong argues that 'the way we approach design can have an enormous impact upon the way that we interact with the world. It can potentially change the way that we approach, and therefore understand, ecology' (Armstrong, 2006: 15). [9]

'[E]cological concerns' then, form a key part of the "transactive design" of *Intimate Transactions* (Armstrong, 2006: 13). We have seen that in order to produce more sustainable changes within the work, the "action" in *Intimate Transactions* must not only emerge from isolated, already individuated bodies or selves (see Armstrong, 2006: 13-16) (from what I referred to above as 'the logic of' already 'delimited sets'). If engagement with the work stops there, this leads to a kind of 'ecological crisis' in what become diminished 'audio-visual' and 'tactile' worlds (Armstrong, 2005). Instead of stopping at individual action, in order to care for the virtual environments, participants in *Intimate Transactions* are encouraged to engage fully in the 'relational potential' (Massumi, 2000a: 202) of the 'logic of affects' (the collective, 'co-creative' and 'trans-subjective levels' of experience). Only if "action"—in this case movement—becomes distributed across a larger affective field engaging both participants (as well as the screen creatures) in a 'co-affective' collaboration does the work take an ethical and reparative turn toward a restoring of ecological balance. From this collaboration a more rewarding experience of the work itself also emerges (see Armstrong, 2005).

The focus on 'co-affective' collaboration in *Intimate Transactions* reflects a less individualised notion of affect, shared by the thinkers discussed in this article. Erin Manning, for example, notes that 'affect does not rest in the individual'. Rather, affect is 'collective' and of the in-between (Manning, 2010: 117 and 122). [10] Guattari writes about the "sticky" 'transitivist character of affect' operating within a 'multi-polar affective composition' (Guattari, 1996: 158). Massumi considers affect 'transsituational' (Massumi, 2000a: 185) and Ettinger thinks affect in terms of 'co-affectivity' (Ettinger, 2000: 98). For all these thinkers affect is located,

beyond the emotional states of the human individual, in a larger distributed field. For these thinkers and, as taken up in the design of *Intimate Transactions*, 'the logic of affects' is generative, collective and 'distributed' (Hamilton, 2006: 118; Armstrong, 2005; see also Ednie-Brown, 2007: 178). [11]

These approaches to affect are shared by Ednie-Brown (2007). They are present in the design philosophy and architecturally inflected art practice she brought to the collaborative creation of the 'haptic components' of *Intimate Transactions* (Armstrong, n.d.). As mentioned, Ednie-Brown has developed a "relational design ethics" 'striving for a balance between affecting and being affected' (Ednie-Brown, 2007: 329).

Belonging

We have seen that, as an ecological work, explicitly concerned with sustainability (Birringer, 2006: 108), *Intimate Transactions* aims to create a care for the world that tends to a more distributed sense of 'ethical responsibility'—in, across, and beyond the artwork (Armstrong, 2006: 15). For Armstrong, *Intimate Transactions* thus works at the level of the 'eco-political' (Armstrong, 2006: 15). Massumi articulates the general aim of this kind of political concern very well, stating that '[t]he "object" of political ecology is the coming-together or belonging-together of processually unique and divergent forms of life' (Massumi, 2000a: 216).

For Massumi 'there are ways of acting upon the level of belonging itself, on the moving together and coming together of bodies *per se*' (Massumi in Massumi and Zournazi, 2002: 223). Massumi also suggests that '[e]thics is a tending of coming-together, a *caring for belonging as such*' (Massumi, 2000a: 216). In general terms, '*caring for belonging*' is relational yet this relationality is 'of the middle', that is, it does not link the 'already-constituted' (Massumi, 1997a: 175). Rather, for Massumi as for Gilbert Simondon 'a true relation is that which constitutes the terms that it connects' (Flanders in Simondon, 2009: 15, see also Massumi, 1997a). The relation itself is a 'co-creative' process, which produces new individuations (see also Brunner and Fritsch, 2011). I have outlined above how *Intimate Transactions* encourages relation – the work is 'highly relational' (Armstrong, n.d.). Yet for the work to be truly transformative this must involve a co-constitutive 'transactivity' productive of new individuations and milieus.

Of course, activating the more affective level of experience does not automatically involve a care for 'belonging-together'. *Intimate Transactions* is affective throughout, yet subtle in its foregrounding of different kinds of affective engagement, some more directed towards 'belonging-together' than others. If participants only work individually and collect object from the non-human creatures there is no care for 'belonging-together'. As we have seen, it is in the more collaborative phases that *Intimate Transactions* explicitly encourages individuations that involve 'a caring for belonging as such' (Massumi, 2000a: 216).

This care 'for belonging' involves a "micropolitical" approach to ethics in that it works at the level of our bodily habits (see Massumi in Massumi and McKim, 2009 and Guattari in Guattari and Rolnik, 2008). In this regard *Intimate Transactions* attempts to resist, by deterritorialising, the more destructive habits of the human body. These destructive habits come to life (and it is hoped that participants become more aware of them) at the moments in *Intimate Transactions* at which it is possible for the participants to impoverish the world of the non-human creatures. *Intimate Transactions* challenges this impoverishment with the offer of a deterritorialisation that can 'restore' and re-enrich the 'virtual world' (O'Neill, 2006: 41) in a 'moving together'. In this restorative movement the participants at different locations move together and participate in a collaborative individuation of new subjective possibilities and worlds. In general, it is hoped (but never guaranteed) that these new individuations will avoid a 'conservative' or exploitative 'reterritorialisation of subjectivity' (Guattari, 1995: 3) and produce a 'caring for belonging' (Massumi, 2000a: 216). To reiterate, such a care does not emerge from the interaction between 'already-constituted' bodies or selves but from the midst of a distributed, vibrating and trans-subjective affect. The care does not emerge from autonomous subjects but from relational 'not one-ness' (Ettinger, 1992: 178, see also Hamilton, 2006).

For thinkers such as Ettinger, Simondon or Erin Manning the question of individuation is complex. Individuation and the body are 'always more than one' (Manning, 2010: 117). It is this 'not one-ness' that *Intimate Transactions* taps into. Yet, again, this 'not one-ness' involves no simple unity, not even in a 'coming-together'. Rather it is a question, as in *Intimate Transactions*, of activating what Pia Ednie-Brown and Inger Mewburn (the creators of the haptic components) call the 'undeniable difference between us'. They write about the haptic components as addressing 'a power that vibrates with the texture of difference'.

In our opinion, the value of this particular project lies in actively exploring ways and means through which we might deal with that difficult political, social, ethical and perhaps universal problem we keep repeating: the difficulty of forming a sense of shared experience amidst the undeniable difference between us. (Ednie-Brown and Mewburn 2006: 87)

So the 'not one-ness' of *Intimate Transactions* does not only concern the simple fact that there is more than one participant. It also concerns the more complex reality of participation. Participation is never foundationally about "the individual" or a "becoming one", but rather about a collaborative becoming that emerges from ongoing individuation—a 'relational movement' in Manning's terms (2009: 29). The main loci for this are the trans-subjective vibrations of bodies and existential territories as they 'come...into being' (Massumi, 2000a: 201).

The work of Simondon is again illuminating. Venn explains that for Simondon 'Being... is neither pure unity nor pure plurality' (Venn, 2010: 150). To think about this in terms of the 'production of subjectivity' (Guattari, 1995: 1) it could be said that the 'subject does not coincide with the individual'. Rather, in what has been referred to here as the "trans-subjective", '[t]he subject in the Simondonian problematic is an ensemble of pre-individuated and individuated realities, thus pregnant with "virtualities" or "potentials"... and still open to further individuation through the collective or group' (Venn, 2010: 150). It is this potential for further individuation that 'comes into being' (Massumi, 2000a: 201) in the 'transindividual' (Simondon, 2009: 8) group processes and experiences in the shared screen-world of *Intimate Transactions*. Throughout there is the question of relations between previous individuations and new individuations.

As mentioned previously, Ettinger and Guattari, like Simondon, place great value on transindividual experience in the individuation of subjectivity. Ettinger develops this with her concepts of the *matrixial* and *metamorphosis* and Guattari with the notion of *transversality*. Both thinkers can further our understanding of the ethics involved in the affective 'transactivity' of *Intimate Transactions*. Ettinger first.

Metramorphic Transactivity

Ettinger's concepts of the *matrixial* and *metamorphosis* are intended to account for the potential ethical and generative dimensions of 'trans-subjective' encounters (Ettinger, 2006a: 111 and 117). They are thus useful when considering what in this article, following Birringer, has been referred to as 'transactivity'.

Trans-subjective encounters include 'aesthetic encounters' *with(in)* art, a major concern for Ettinger (Pollock, 2004: 7; Ettinger, 2006b). Ettinger's concepts describe a relational

distribution of subjectivity (across bodies and aesthetic 'elements' for example) (Ettinger, 1993a: 39; Pollock, 2004: 7). As such, her concepts enable us to think an artwork's active participation in the ongoing individuation of subjectivity (Ettinger, 1997: 639). [12] In short, 'the matrixial stratum of subjectivization reveals subjectivity as an encounter of co-emerging elements through metramorphosis' (Ettinger, 1996:125).

Let us begin with the matrixial. What Ettinger (2007) terms the *matrixial* is situated in a larger 'trans-subjective sphere'. Ettinger thinks of the matrixial (the 'trans-subjective') as a feminine force. However, this does not imply that the matrixial is 'about women' as such (Ettinger, 1993b: 18). Ettinger comments that the matrixial is not about 'Oedipal gender difference' (2006b: 69). Rather, the matrixial concerns the 'trans-subjective' ("the feminine" if you like) for all genders (see also Massumi, 2000b: 31). Ettinger refers to this 'trans-subjectivity' (1999: 15) as an 'enlarged subjectivity' or 'subjectivity-as-an-encounter' (1996: 133 and 145). The main point is that the matrixial conceptualises a *distributed* moment in the production of subjectivity (Ettinger, 1996: 153) – 'trans-subjectivity in *severality*', to again use Ettinger's conceptual vocabulary (1999: 15). In *Intimate Transactions*, the distribution involved moves beyond the individual body or psyche, into what Ettinger (2006b) has termed a larger *matrixial borderspace*. This 'borderspace' has its own force – the force of what Ettinger calls 'relational difference in co-emergence' (Ettinger, 1995b: 30). I am suggesting here that the collaborative phases of *Intimate Transactions* allow participants to begin to experience the *trans-subjective* and *ethical* force of this 'borderspace' more directly.

In Ettinger's (2009) terms *Intimate Transactions* could be described as an 'encounter-event'. This kind of event involves encounter between what Ettinger terms 'co-emerging *I(s)* and *non-I(s)*' (Ettinger, 1996: 127). This is a productive co-emergence between that which is emerging as "me" and that which is not "me", but which co-emerges with "me". 'Non-I(s)' may include 'inanimate objects' (Ettinger, 2006b: 90) or 'non-human' life (Pollock, 2004: 7)—such as the creatures of the screen-worlds of *Intimate Transactions*. Crucially, both '*I(s)* and *non-I(s)*' are 'partial'. They are part-'elements' or 'partial-subjects' within the broader and ongoing *production of subjectivity* (Ettinger, 1996: 154 and 129). In addition, like the two participants in *Intimate Transactions*, '*I(s)* and *non-I(s)*' may be 'unknown' to each other—even, as in *Intimate Transactions*, never really meet, remaining anonymous (Ettinger, 1997: 638). They can nevertheless still connect in some way and affect each other (see Ettinger, 2006b). Ettinger explains that 'the trans-subjective level, as the time-space of encounter-event is shared by several intimate-anonymous *I(s)* and *non-I(s)*' (Ettinger, 2006a: 111).

Ettinger's conceptualisation of a quality of subjectivity in terms of 'co-emerging *I* and *non-I*' (Ettinger, 1996: 134) reminds us of Armstrong's commitment to 'ecological subjectivity'. Armstrong explains: '[w]ith my interest in ecological subjectivity I was exploring ideas

of things that are close to what I understand as “me” and then moving towards things that appear to be “separate from” or “unknown to me”, yet that I understand my body is undivided from’ (Armstrong in Armstrong and Gallash, 2004). I would argue that this ‘ecological subjectivity’ works at the level of the ‘co-affective’: in a sense it is matrixial.

Ettinger writes about the matrixial in terms of ‘co-affectivity’ (Ettinger, 2000: 98). She writes of a ‘co-poietic transformational potentiality’ that moves beyond ‘inter-subjective relationships’ and ‘verbal communication’—and beyond “interactions” between clearly identifiable bodies, objects or subjects (Ettinger, 2005b: 703).

It is important to note that in the *matrixial realm* trans-subjective expression becomes not only ‘co-affective’ but possibly also ethical (see Ettinger, 2009). It is such ‘co-affective’ and ethical expression that may emerge in *Intimate Transactions*. Without ever gaining ‘absolute control’, the actions of the participants affect the entire work and all the screen-worlds (Armstrong, 2005). As mentioned above, this becomes particularly evident when, in the collaborative phases of the work, the participants can move together. At these moments there is ‘not a filtering of the other through the one’ (Ettinger, 1993a: 68). Rather, what is experienced is what Ettinger terms ‘metramorphosis’. [13]

Metramorphosis, in the individuation of subjectivity, and in art, is concerned with transformative engagement and ‘co-affective’ becoming. It is different to metamorphosis in that *metramorphosis* is without a resolution of these becomings into a ‘unity’. One “thing” does not simply become “something else” (Huhn, 1993: 8). Thus Ednie-Brown and Mewburn’s focus on ‘the *undeniable difference between us*’ in their design of the vibrating components for *Intimate Transactions* (Ednie-Brown and Mewburn, 2006: 87). For Ettinger, *metramorphosis* concerns the between of this ‘*undeniable difference*’.

‘*Metramorphosis is the becoming threshold of borderlines*. Through such borderlines, an ever continuing negotiation between *I(s)* and non *I(s)* passes’. Ettinger writes that ‘[w]hen changes occur in the borderline between two fields, they produce changes in both fields’ (Ettinger, 1993b: 13).

Rosi Huhn explains that ‘in contrast to metamorphosis, each of the new forms and shapes of *metramorphosis* does not send the nature of each of the preceding ones into oblivion or even eliminate it’. Unlike metamorphosis, *metramorphosis* ‘leads an existence of multitude rather than unity. It is in this quality that the program of the “Matrixial” conception of the world manifests itself’ (Huhn, 1993: 8).

In sum, metamorphic processes are different to metamorphosis. One side of the process is not left behind for the sake of the becoming of the other. Both are transformed. "Interaction" here truly begins to take shape as 'transactivity'. Arguably in being designed for ecological trans-activity, *Intimate Transactions* also moves toward the metamorphic.

As we have seen, because metamorphosis is 'co-affective', it provides a possibility for 'ethical encounter' (Ettinger, 2006a: 132). This implies that creating, collaborating, thinking, designing or making artworks metamorphically also provide a possibility for 'ethical encounter'. Ettinger's ethical approach to encounter takes account of the inherent and non-reductive difference in any 'encounter event' (Ettinger, 2009). It allows for the always present 'difference' in the 'co-emergence'.

It is this kind of non-reductive difference that is experienced in *Intimate Transactions*. As we have seen, the design of the work enables participants to sense the productive and 'undeniable difference between us' (Ednie-Brown and Mewburn, 2006: 87). This is one of the qualities that makes this complex work so powerful. Beyond the 'visible changes' (Webster, 2006: 69) you feel and hear the 'undeniable difference' of the creatures and the 'co-emerging' other participant.

As I have mentioned, the encounters with the creatures are felt through vibrations in the stomach 'garment' (the rubbery device). These sensations differ depending on which creature is encountered (Ednie-Brown and Mewburn, 2006: 81-82). Webster has described the specific sensations in the various encounters with the different creatures in some detail. He explains:

Permanence is based on the idea of a rock, and it responds minimally to your presence. The sounds for Permanence are based on a deep, meditative series of sounds. There are minimal sound and motion changes, but Permanence responds by vibrations

Torment, on the other hand, is based on the personality of a voracious insect. And it doesn't like your presence. It moves a lot. So it is very difficult to engage with. The sounds of Torment are breathy. Rhythmically, it is very fast and shaky...

Each creature has its own designated series of vibrations that change as you interact with them. For instance, Conflict starts pretty harshly and it becomes harsher, until it

starts to shake you. Since you're right in the middle of the space, your whole world becomes intense. (Webster, 2006: 69)

However, not only do the participants feel the specific differences of the various creatures. Recall that when participants are 'moving together' to 'restore' the 'virtual world[s]' they also feel each other. O'Neill explains that 'the movements of the other participant are relayed by pushes and pulls that are felt through the backboard of the shelf' (O'Neill 2006: 41-42). It is actually possible to 'feel' the 'direction' in which the other person is moving (Webster, 2006: 66): possible to 'feel the directional push of the other' (Ednie-Brown and Mewburn, 2006: 81).

To employ Ettinger's vocabulary then: in *Intimate Transactions* we feel the movement of 'non-I(s)' and the exchange between 'I(s) and non-I(s)'. We feel the vibration or pull of the other in a 'moving...and coming together of bodies' as this exchange (Massumi in Massumi and Zournazi, 2002: 223). Creatures, Bodies, Bodyshelves, sound, the haptic device on the abdomen, and the 'screen-worlds' become sites for this exchange as each participant is in affective encounter with their own gallery space, the localised screen-worlds and their creatures, the 'shared world' and the other participant (Birringer, 2006: 107). It is here we understand the different (perhaps more ethical) approach to interactive art and design suggested both by aspects of *Intimate Transactions* and Ettinger's concepts of the *matrixial* and *metramorphosis*. For, as interaction becomes 'transactivity' we have to enter into a 'co-affective' movement – *metramorphosis* – in order to 'restore' worlds (in *Intimate Transactions*, the worlds of the screen creatures), to *share worlds*, or just to bring back some energy and joy to encounters within and between the separate gallery spaces (see Birringer, 2006).

Metramorphic 'becoming-together' then (Ettinger, 1995a: 30), is a process that gives 'expression' to 'differential mutual emergence' (Massumi, 1997b: 779). Furthermore, as I have detailed above, metramorphic 'becoming-together' is important in that it provides the 'logic of affects' with ethical force. Again, it is such 'becoming-together', with difference at the core, that begins to be *rendered perceptible* (Deleuze and Guattari, 1987: 281) in *Intimate Transactions*. *Intimate Transactions* thus encourages the *matrixial quality of subjectivity*—'relational difference in co-emergence' (Ettinger, 2006b: 72)—to become the main aspect of the experience for participants. This gives the experience an ethical pull. Recall that the haptic quality of the work in particular enables one to feel the force of this. Ednie-Brown and Mewburn writes that 'its fruits lay in understanding something of the nature of the power situated between us'. As mentioned this is 'a power that vibrates with the texture of difference' (Ednie-Brown and Mewburn, 2006: 87). For me it is also this slightly surprising quality of the work—surprising because the vibrations on the stomach and lower back are so intimate—that enables one most effectively to enter into a creative and restorative becoming

with the creatures and the other participant (O'Neill: 2006: 41). It is this kind of becoming—not always easy or harmonious—that can tend to the complexity involved in caring for the contemporary world and a differentiated 'belonging-together' (Massumi, 2000a: 216).

Transversal Group Eros

This 'belonging-together' is also central to Guattari's work. Here we can extend the discussion of metamorphic 'transactivity' toward collective life as, for Guattari, 'the production of subjectivity' (Guattari, 1995: 1) needs to be thought in relation to the group – as 'group subjectivity' (Tinnell, 2011). Even the supposed "individual" is a 'group subjectivity'. This group subjectivity involves a consideration of 'existential territory' understood here via what Guattari calls transversality (see also Armstrong, 2005 and 2006 and Genoski, 2000). Guattari writes that 'it appears opportune to forge a more transversalist conception of subjectivity, one which would permit us to understand both its idiosyncratic territorial couplings (Existential Territories) and its opening onto value systems (Incorporeal Universes) with their social and cultural implications' (Guattari, 1995: 4).

Guattari's 'transversalist' notion of subjectivity, together with the idea of *existential territory*, enable Guattari to develop a theory (and a politics) of subjectivity with multiplicity, collectivity and difference at the centre (see Guattari 1995 and 1996). Thus Guattari develops 'a conception of the individual as fundamentally a group, a social subject, a group subject' (Genosko, 2000: 156). Gary Genosko explains that 'Guattari stakes a sociological claim with Eros, while Freud [in the end] chooses an anti-sociological principle in the name of Thanatos [the death or destructive drive]. For Guattari, Eros and the Group triumph over Thanatos and the individual': This implies that Guattari enforces 'Eros and Society over the death drive and the narcissistic individual' (Genosko, 2000: 155). [14]

This is interesting in terms of the experience of *Intimate Transactions*. *Intimate Transactions* makes us very aware of our more destructive habits and drives, especially in the phase of the "interaction" during which we can collect objects from the non-human creatures. At this stage, the work allows for more individualistic tendencies: yet it does so via a diminishing of the experience of the work and the worlds of the creatures. The result is that there is not much affective 'moving together'. Here we can see that, even though *Intimate Transactions* in its final incarnation adopted features similar to many 'multiplayer game engine[s]' and competitive computer games, such as avatars and the principle of 'collecting...objects' from the creatures (Armstrong, 2005), the work is structured so as to draw the participants away from many of the regular outcomes and modes of engagement involved in much

gaming. For a start, *Intimate Transactions* is not competitive (Armstrong, 2005). Also, instead of a destructive individualism, as we have seen, in the more rewarding phases of the collaboration a kind of transversal *group Eros* is at work. A 'co-affective' drive vibrates on our bodies, destabilises established, often narcissistic or destructive habits and leads to a reparation of the virtual screen-worlds.

This is very different to my own first experience of an interactive virtual game environment, back in the mid 90's. The game was *Pterodactyls*. We paid a fair amount of money for about three minutes spent in two different support systems, wearing large helmets and holding handheld controller-guns. Our handheld controllers could shoot things—*Pterodactyls* or any other moving creatures, including, as it turned out, each other's avatars. I couldn't see anything. As an unexperienced gamer, I didn't know what to do, feeling disoriented, I was just standing around. My co-player saw this. Thinking that I would know where I was if I turned around, he called out to me to do so. I did—physically and in the game. However, the context of years of conditioning took over and my avatar was shot. My co-player (a more conditioned game player) thought that I would get a few more lives but my avatar fragmented and failed to reappear (see also Murphie, 1997: 738). For the last few minutes of the game the other player was a lonely avatar looking to uncaring pixelated *Pterodactyls* for company. In *Pterodactyls* there is little 'ethical potentiality' (little 'relational difference in co-emergence'), little collaborative *group Eros* or 'belonging-together'—the power of 'co-affective' metamorphosis is severely diminished.

The comparison between *Intimate Transactions* and *Pterodactyls* is stark. *Intimate Transactions* encourages collaboration in order for us to enrich the virtual screen environments and the gallery spaces (Hamilton, 2006: 128). One is not alone—the world vibrates 'with the power of difference' on the core of the body. Relation—'difference between us'—is felt within and beyond the visual world (Ednie-Brown and Mewburn, 2006: 87).

The Virtual/ "Interaction"/Relation

A more philosophical conceptualisation of the virtual (one in which the virtual is not reducible to "VR" or the 'visible world') becomes important here (Murphie, 1997: 715; Guattari, 1995: 91). For Massumi, the virtual is that which holds 'relational potential'. Moreover, the virtual holds this 'relational potential' in excess of what 'actually occurs' (Massumi, 2000a: 202; 2002: 110). As we have seen, Ettinger's concept of the matrixial is a way of understanding how this 'relational potential' can take on an ethical quality. The matrixial expresses 'relational difference in co-emergence'. This 'relational difference' is ongoing because the 'relational potential' of the work is not exhausted in what 'actually occurs'.

As we have seen, the matrixial, and with it metamorphosis, express 'relational difference in co-emergence'. If *Intimate Transactions* could be seen as a metamorphic work, then it is a work that enables 'relational difference' not only to emerge but to replenish itself by being open to that which exceeds what 'actually occurs'. In short, the metamorphic processes in *Intimate Transactions* suggest a 'relational potential' that is never exhausted, even by the 'transactivity' that takes place within the actual work.

At the same time, as Massumi points out, '[any particular] potential does not pre-exist its emergence' rather, it 'comes into being, as becoming' (Massumi, 2000a: 192 and 201). There is a specificity to particular events of encounter. Each encounter within *Intimate Transactions* is a singular and unique actualization of the 'relational potential'—virtuality—in which the work has been created to immerse itself. This is despite the fact that each encounter with the work takes place in the same (technical) setting. Guattari suggests that it is here—with regard to the 'virtual' and not just the actual and 'visible world'—that various art forms, including "interactive" work like *Intimate Transactions*, 'have an important role to play'. Such work can participate in a recasting of the 'the axis of values' (Guattari, 1995: 91), precisely in terms of a concern with the 'relational potential' involved. For Guattari 'an ecology of the virtual is' thus 'just as pressing as ecologies of the visible world' (Guattari, 1995: 91). However, if we are concerned with relation and the virtual, as thought in the terms above, then the notion of "interaction" also needs to be reconfigured (Massumi, 1997a; 2000a and 2011).

Andrew Murphie has written about interactivity in terms of 'interactive becoming', which involves a taking account of the virtual (Murphie, 2005: 32; 1996), and Massumi suggests that '[w]e... translate the concept into relational terms' (Massumi, 2011: 67; see also Brunner and Fritsch, 2011 and Fritsch, 2011). [15]

Massumi notes that 'interaction' has at times been conceived as 'a going back and forth between actions, largely reduced to instrumental function'. Yet this kind of instrumentality—present in the game *Pterodactyls*, for example—does not fully allow for the potentiality of relation and, as with my experience of the game, the work too easily loses its intensity (Massumi, 2011: 46-52).

In short, if one is concerned, as in *Intimate Transactions*, with artworks that are "eco-ethical" (see Armstrong, 2006), 'it is...not enough' to 'simply' celebrate "interactive" work. Rather, attention must be paid to 'what modes of experience' the work creates (Massumi, 2011: 48). Massumi argues that with a shift from thinking in terms of interaction to 'thinking/feeling' in terms of relation there is also a shift in focus onto the 'relational potential' of the situation

the work both creates and immerses itself within [16]. Massumi suggests that it is when 'interactive art' takes 'a situation as its "object"... not a use...not a behaviour...not a action-reaction' that it may become more than a game—possibly art (Massumi, 2011, 52-53, 47 and 78). The work 'can take a situation and potentially "open" the interactions it affords'. This implies 'that the relational potential it tends-toward appears' (Massumi, 2011: 52).

As we have seen, *Intimate Transactions* takes 'a situation as its "object"', not just the "interactions" between 'discrete elements' or bodies (Massumi, 2000a: 191). [17] In fact, Birringer considers *Intimate Transactions* in terms of the 'situation' of an entire 'transactive environment' (Biringner, 2006: 109). This is an environment that aims to keep the 'relational potential' of the work alive. As art (again, this is particularly obvious in the vibrations and the sound), *Intimate Transactions* 'tends-toward' a 'care for belonging' that concerns but exceeds the human participants. This care emerges most obviously at the stage of the work when there is a restorative and collaborative metamorphosis of bodies and creatures.

In fact, in *Intimate Transactions*, there is usually more than one situation involved. A number of ongoing individuations are 'interlaced' (Ettinger, 1999: 18). It is in the work's commitment to a fostering of engagements between these multiple situations that we can understand the relation between affect and 'transactivity' (see also Hamilton, 2006). For Massumi, affect moves between and connects situations (Massumi, 2000a; 184-185)—the two gallery spaces in *Intimate Transactions* provide a very clear example. As mentioned previously, affect is 'multi-polar', 'transitivist' and 'co-creative'. It concerns sociality across situations rather than the personal (Massumi, 2000a: 178-182). In Massumi's terms 'affect is transsituational' (2000a: 185). It can deterritorialise the local screen environments and move toward a transsituational 'shared world' (Biringner, 2006: 107). In *Intimate Transactions*, as we have seen, this is a world based on 'co-affective' collaboration and care for difference.

Ednie-Brown has drawn on Massumi's notion of affect as trans-situational in her conceptualisation of the importance a 'trans-situational sensitivity' to the kind of process and collaboration involved in *Intimate Transactions*. She writes—

Trans-situational sensitivity dislodges the 'contextual' from the assumption that one stands back and observes things 'as-they-are', as if there is a fixed worldly essence to be found. Similarly, it erodes navel-gazing or self-absorption in which the kingdom of the self and its expression reign insensitively supreme. (Ednie-Brown, 2007: 328)

It is this kind of sensitivity that emerges in/through *Intimate Transactions* (see Ednie-Brown, 2007: 327-328).

In order to fully understand the importance of a 'trans-situational sensitivity' to 'co-affective' collaboration and process (rather than individual action) I will now give a brief account of Massumi's conceptualisation of affect as trans-situational.

Transsituational Affect

Massumi's develops the notion of affect as transsituational in relation to the 'experience of colour'. His starting point is an experiment from 1911 where the subject of the experiment is asked, based on recollection, to 'match' the colour of a 'friend's eyes'. In the experiment the recollected colour is nearly always more 'saturated' than the actual eye colour—it is 'too-blue' (Massumi, 2000a: 178). This 'excessive' experience of colour is excessive in that it exceeds 'personal' memory or emotion. Massumi speculates that the experiment 'staged...a co-functioning of language, affect and memory' that is 'situational' rather than 'personal' (2000a: 178-182). In short, for Massumi the exaggerated recollection of the colour is in part due to the 'situation' of the experiment (2000a: 179 and 189). In this situation, the actual 'remembering of the colour is not effectively a reproduction of a perception, but a transformation or becoming of it' (Massumi, 2000a: 180). As it is a situational becoming—related in part to the experiment itself—toward a 'too-blue', the affect involved cannot be reduced to personal emotion (Massumi, 2000a: 184).

Massumi goes on to explain 'emotion' in terms of 'personalized content' while he uses 'affect' to conceptualise 'the continuation' beyond the realm of the personal (Massumi, 2000a: 185). Again, the recollection of a friend's eyes as 'too-blue' involves a situational 'excess' of colour that cannot be reduced to 'personal feeling'. Thus, for Massumi affect ('the logic of affects') is both 'pre-personal' and also 'continues' after the individuation of feeling. This is to say it is also 'post-personal'. Affect involves a kind of 'presence of process' (Massumi, 2000a: 185). As we have seen it is this 'presence of process' that is emphasised within the design and experience of *Intimate Transactions*. Both the different screen environments, and the complex cross-sensory sound/vibration design, register the constant process of 'transactivity' across the two gallery spaces (Birringer, 2006)

This can be taken a little further. Massumi explains that the 'continuation' of the 'personalized content' beyond the personal involves the context of emotion entering the 'relational situation' of affect (Massumi, 2000a: 185 and 199). 'Affect is vivacity of context: situation. Affect enlivens'. Context on the other hand processes a 'relative stability' in that it 'pre-exists' (Massumi, 2000a: 187 and 181).

In *Intimate Transaction* affect, even in the terms of excess described here, is expressed in the situation of the environments on the screens. This situation is the enlivening of the more or less stable contexts (technical and otherwise) in which the experience of the work takes place. However, *Intimate Transactions* is also 'transsituational' because there is a deliberate bringing together of multiple situations, (expressed, for example, in the sound, the shared screen-world and the vibrations). This only begins with the two different situations of the galleries. This deliberately designed possibility for (networked) transsituational collaboration can deterritorialise the more destructive habits of the individual (or, one could say, of the 'context') (Massumi, 2000a: 185). Although, in one sense, the technical design of *Intimate Transactions* is clearly quite stable, designed as a repeatable 'context', in another way the design of the work quite deliberately 'tends toward' an opening to the 'transsituation' (Massumi, 2000a: 185), to relational potentiality, affect (and the trans-subjective). Massumi's suggestion that 'affect is transsituational' becomes very useful here (Massumi, 2000a: 185).

In *Intimate Transactions* the 'co-creative' meeting in the worlds on the screen, the gallery spaces, the sound, the movement and the vibrations on the body could all be understood in terms of such an affective transsituationality. Thus Ednie-Brown's focus on 'trans-situational sensitivity', rather than 'context' (Ednie-Brown, 2007: 327-328).

It is in particular in the excessive and unexpectedly intimate felt vibrations between situations that affect 'continues' and moves toward the 'transsituational' (Massumi, 2000a: 185). One could say that in their 'excess' these vibrations 'will overflow' or 'escape' and 'enter other situations' (Massumi, 2000a: 184-185). In fact, Massumi suggests that the 'context-rocking transsituational drift' of affect 'holds the world together'. It 'is the life-gluue of the world—a world capable of surprise' (Massumi, 2000a: 185-187).

So to sum up, the joint 'co-creative' world in *Intimate Transactions* 'continues' and becomes 'transsituational'. 'As discursive content, it comes to be. As excess, it continues' (Massumi, 2000a: 185). The 'co-creative' world becomes transsituational within the work and, just as importantly, beyond it. The latter is another aspect of the ethical potentiality of *Intimate Transactions*. The work is capable of creating a care that lingers beyond the actual experience itself, as the ongoing possibility of changing modes of living and relating (see Armstrong, 2006: 16).

It is again important to emphasise that it is the excessive aspects (the vibrations, to take only one example) that participate in, to some extent enable, the individuation of new modes of relation. For Massumi such 'excess' allows for a relationality that is 'not reducible' to 'personalized' emotion. Rather, as affect, this excess involves 'movement', 'inhabits... passage' and concerns a 'joint situation' (Massumi, 2000a: 219, 185 and 181).

For me, another good illustration of such an excessive affect—a 'continuation', which moves 'personalized content' toward a 'joint situation' (Massumi, 2000a: 181) – is Alice's encounter with the Cheshire Cat in her adventures in Wonderland. In Wonderland, Alice comes across the cat a number of times. The first encounter is described as ending like this:

"Did you say 'pig', or 'fig'?" said the Cat. "I said 'pig,'" replied Alice; "and I wish you wouldn't keep appearing and vanishing so suddenly: you make one quite giddy!"

"All right," said the Cat; and this time it vanished quite slowly, beginning with the end of the tail, and ending with the grin, which remained some time after the rest of it had gone.

"Well! I've often seen a cat without a grin," thought Alice; "but a grin without a cat! It's the most curious thing I ever saw in all my life!". (Carroll, 1960: 90-91)

Engaging with Lewis Carroll, Deleuze writes that his books 'let an incorporeal rise to the surface like a mist over the earth, a pure "expressed" from the depths: not the sword, but the flash of the sword, a flash without a sword like the smile without the cat' (Deleuze, 1997: 22).

In a sense this affective 'smile' is 'pre-personal'—a kind of 'pre-personal' "animality". Yet it is also 'post-personal', the 'continuation' of the 'personalized content' beyond the personal, the context of emotion entering the 'relational situation' of affect (Massumi, 2000a: 185 and 199). If we follow Deleuze and Guattari, it could be said that *Intimate Transactions*, as in the meeting of Alice and the cat, extracts 'a consistent event from the [context and] state of affairs – a smile without a cat, as it were...' (Deleuze and Guattari, 1994: 126). Again, any situation, such as that of Alice and the cat, is always a meeting of situations.

I would suggest that it is through a becoming 'transsituational'—through a 'moving together' as in *Intimate Transactions*—that the vibrations surprise and linger. Like the smile of the cat

they can take us to Wonderland, or at least toward wonder. This wonder provides a further ethical potential for 'transactivity' in art. [18]

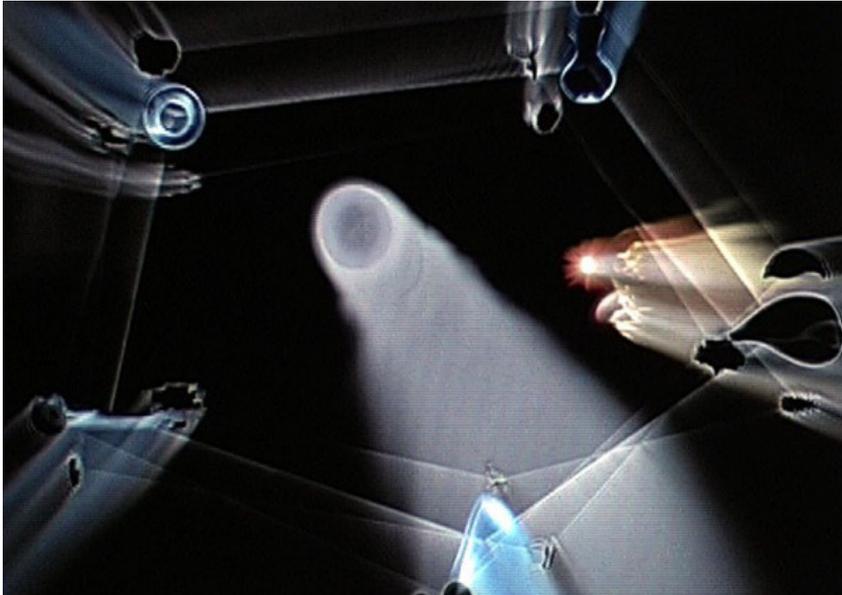


Figure 7: 'Inside Instability'. Image by Keith Armstrong.
Source: <http://www.embodiedmedia.com/>, with permission of
Keith Armstrong

Relational Causality and Wonder

Massumi argues that "affect" and the kind of 'moving together' discussed so far—a 'joint situation'—involves a 'relational' or 'quasicausal openness'. It is concerned with 'sensing something new' (Massumi, 2000a: 193). He explains:

Relationality cannot be accounted for by the objective properties of the actual ingredients in play considered as discrete elements. It cannot even be reduced to the interactions that may logically be predicted according to those properties ... Relationality pertains to the openness of the interaction. Rather than to the interaction per se or to its discrete ingredients. (Massumi, 2000a: 191)

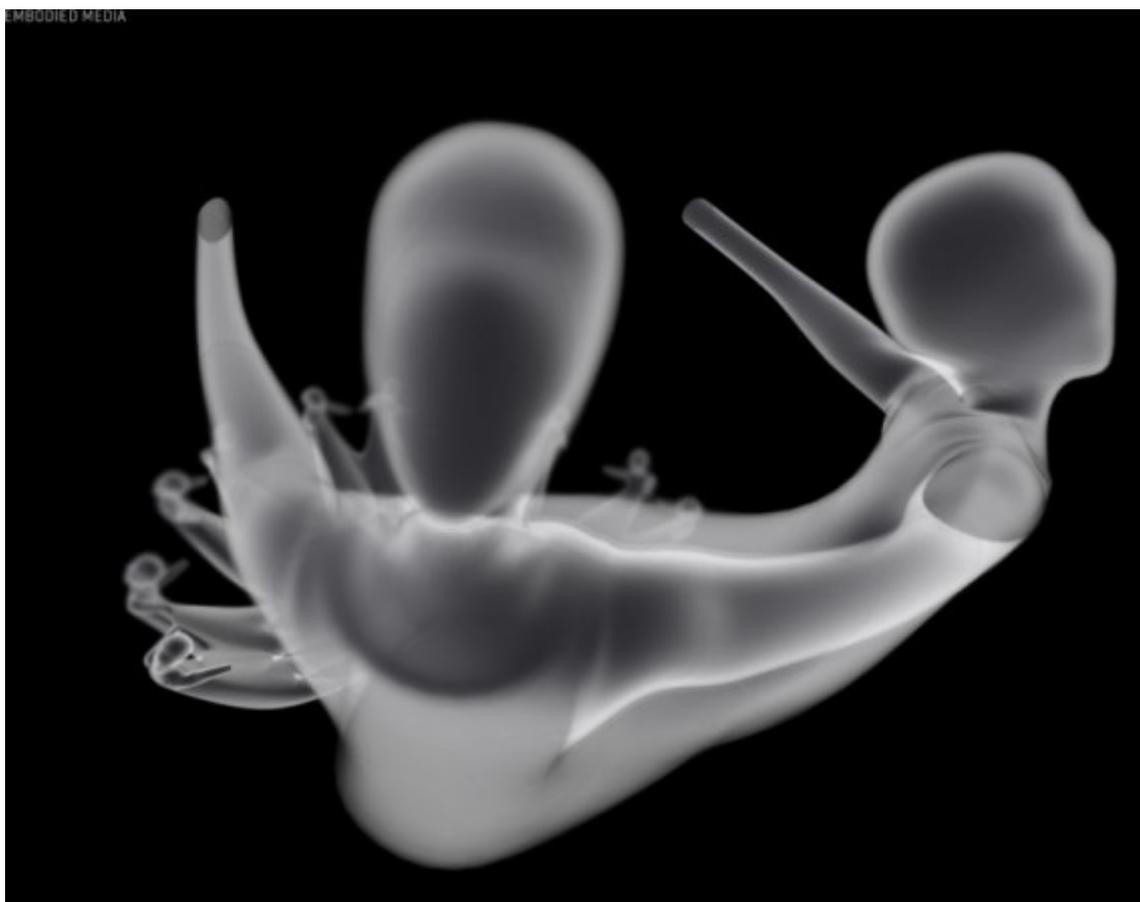


Figure 8: 'Shared body group'. Image by Stuart Lawson.
Source: <http://www.embodiedmedia.com/>, with permission of
Keith Armstrong

This 'openness of the interaction'—its sociality, rather than the 'discrete ingredients'—is echoed in Ettinger's concept of metramorphosis.

The experience of this 'openness' comes 'to the fore' in *Intimate Transactions* (Massumi, 2011: 45). It is perhaps for this reason that, although one doesn't feel unsafe in *Intimate Transactions*, one feels a little uncertain and a little fragile. Surprised by the vibrations, for example, one wonders exactly what is going on and where one is (see Birringer, 2006: 109). Yet *Intimate Transactions* encourages one, in such wondering, to be like the traveller discussed by Whitehead. Whitehead wrote: 'A traveller, who has lost his way, should not ask, Where am I? What he really wants to know is, where are the other places' (Whitehead, 1985: 170). It is this kind of question, involving wonder and surprise, rather than certainty, that will keep the future alive (see Massumi, 2000a: 203-205). However, it is again important to remember that, as in *Intimate Transactions*, wonder does not primarily emerge from a 'personalized' feeling or attitude. Rather, if we follow Irigaray wonder is 'A third dimension. An intermediary. Neither the one nor the other' (Irigaray, 1993: 82). [19] Drawing on Irigaray,

Ziarek explains that wonder 'operates as a transformative interval' and 'produces a change not simply in the manner of the subject's being but in the very mode of the relation itself' (Ziarek, 1999: 6). Wonder is here conceived in terms of relation. It does not emerge from any individual "being". Rather, it is a constitutive force (Irigaray, 1993; Ziarek, 1999).

In *Intimate Transactions*, if the pull of the work is followed, one does not get much of a feeling of being an isolated individual in control of the screen-world and its creatures. As mentioned, individual control is not encouraged by the very design of the work. There is, for example, no straightforward identification with an unchanging figure in an image world. Armstrong points out that throughout the engagement with the work 'a cascade of audio-visual and tactile feedback ripples back and forth through the server. This results in continual changes in the fluidity and movement qualities of the avatars' (Armstrong, 2006: 33). Furthermore, as we have seen, the participants in *Intimate Transactions* are not encouraged to control the world through individual force. Rather what enlivens the work is an assemblage of forces – a networked, 'collective' or 'relational movement' (Birringer, 2006: 112; Manning, 2009: 29).

In games like *Pterodactyls*, however, one experiences a fairly clear relationship between "self" and avatar, and between subject and object. The aim is to be in control of anything that is "not-me" (the two players have guns for shooting anything "not-me", most obviously). In such "interactive" games there is not much space for a 'relational difference in co-emergence' that will 'restore' the 'virtual world' and keep it alive (O'Neill: 2006: 41).

As opposed to many standard interactive games then, *Intimate Transactions* gains its intensity through a wonder that emerges from the complexity of the meeting of bodies,

sound, creatures, screen worlds, vibrations and the two different gallery spaces. This wonder leads toward the 'new' (Irigaray, 1993: 75), not only within the experience of *Intimate Transactions* but, as suggested, beyond it. Here we can briefly turn again to the work of Massumi.

Massumi's concern with change and the new is linked to both the possibility for surprise and to wonder (see also Irigaray, 1993). Like Whitehead (1968: 168) he discusses wonder in relation to philosophy and explains that philosophy 'prolongs wonder' because (as in *Intimate Transactions*) philosophy 'works... "against the stream of perception" as Bergson used to say, towards relationality "in itself"; towards the virtual' (Massumi, 2000a: 203).

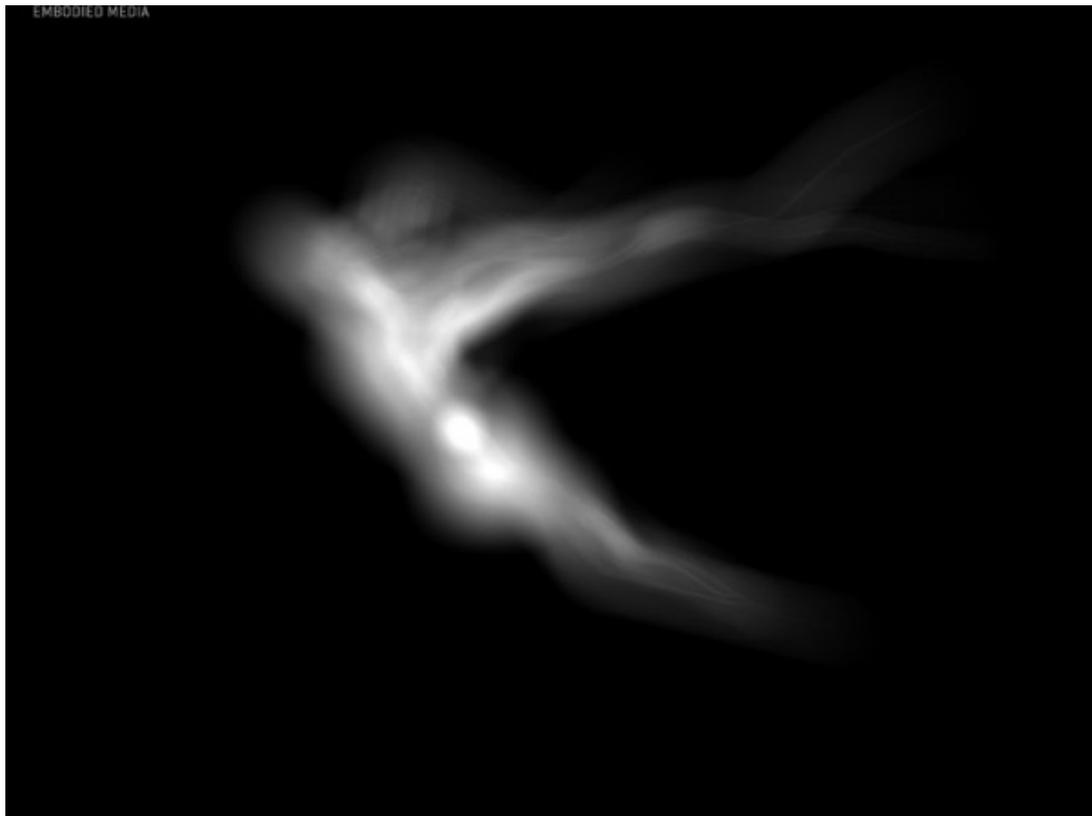


Figure 9: 'Force of Change', Image by Stuart Lawson.
Source: <http://www.embodiedmedia.com/>, with permission of Keith Armstrong

For Massumi—

Wonder is pre-philosophical, in the same way that habit is pre-scientific. Science formally prolongs habit (the reception of the new in an a priori mode of recognition). Philosophy speculatively prolongs wonder (the remainder of surprise persisting across its a priori capture by habit). (Massumi, 2000a: 205)

Certain habits may be problematic. As mentioned these more problematic habits are given room in the phase of *Intimate Transaction* when objects can be removed from the creatures. They certainly dominate the interactive game *Pterodactyls*. However, as the 'activity dedicated to keeping wonder in the world' philosophy, (like the more collaborative phases in *Intimate Transactions*, when participants come together to restore the worlds of the creatures and the gallery spaces), can avoid an arrest by more troublesome habits and 'take a situation' (Massumi, 2011: 52) toward 'the [becoming] of a relation' (Massumi, 1997a: 203; see also 2000a: 203).

Wonder. This is where philosophy comes in. Philosophy is the activity dedicated to keeping wonder in the world... Philosophy then starts with the accompaniment: the perceived effects of relational quasicausality. It starts with the glow. Or the too—of the blue. (Massumi, 2000a: 203)

Or perhaps it starts with a 'relational' and 'quasicausal' vibration on the stomach or lower back. For Massumi 'relational quasicausality' is the kind of causality that appears when the subject/object division is broken down: A quasicause has to be understood as referring 'to effects that can only be explained relationally' (Massumi, 2000a: 202). In *Intimate Transactions*, for example, causality is no longer unidirectional (not that it ever really is). Rather, it is relational. Causality and with it responsibility become distributed (networked), emerging from an affective trans-subjective field. This is a causality that emerges from the relation itself ('transsituation' rather than 'context' [Massumi, 2000a: 185]). It thus cannot be discussed as a clear division between cause and effect associated with a subject and an object. Rather 'relational quasicausality' emerges from and keeps the 'relational potential' of the work alive. It enables something new to emerge across and between situations (Massumi, 2000a: 202).

Massumi explains that '[c]lassical cause concerns context' while 'quasicause concerns situation. Classical cause is reactive, in other words active-passive' while '[q]uasicause is sensitive-affective, or creative....it expresses a real material reserve of unpredictable potential' (Massumi, 2000a: 192).

'[U]npredictable potential' is expressed in the 'co-creative' and collaborative phases of *Intimate transactions*. With this affective 'co-creation' it becomes possible for the participants in *Intimate Transactions* to 'reopen their becoming-together to a relational quasicausality' (Massumi, 2000a: 206). In *Intimate Transactions* a more 'relational quasicausality' 'becomes expressive' (Deleuze and Guattari, 1987: 315) not only in the vibrations on the body or in the sound but within the complexity of the entire situation (see also Massumi, 2000a: 193). [20] The 'transsituation' itself 'becomes expressive' and a new '[trans]subjective music' is literally 'composed' (Guattari, 1996: 267, See also Webster, 2006: 70).

Diagrammatic 'Transactivity'

How might this leave us with a more general approach to designing for relational 'transactivity' in new media art and design? One way of answering this question may be to

ask whether *transsituational affect* can be diagrammed, and if so, how (see Ednie-Brown, 2007: 327)? Ednie-Brown proposes the concept of the 'affective diagram'. For Ednie-Brown (who draws on Deleuze here) the '[affective] diagram is an assemblage of relations wherein the power to affect and be affected is distributed' (Ednie-Brown, 2007: 178). She further suggests that 'trans-situational sensitivity is also a sensitivity to the affective diagram' (Ednie-Brown, 2007: 327). However, '[t]he affective dimensions and sensual experience of relations—or that which constitutes affective diagrams—tend to be repressed under the mantle of representation' (Ednie-Brown, 2007: 198). The diagram must therefore be conceived of in more dynamic terms than as a static representation (see Watson, 2009: 11; Munster, forthcoming; Ednie-Brown, 2007: 198). [21]

Here we can consider an approach to the diagram outlined in Guattari and Deleuze's work. [22] For Manning, who follows the thought of Guattari and Deleuze in a move beyond the representational, the 'diagram is not content driven'—that is, it does not work with context and signification. Rather, the diagram 'operates at the interstices of composition where the virtual is felt as a force of becoming' (Manning, 2009: 125). Similarly, Watson explains that for Guattari, the diagram is not a 'static image'. Rather, the diagram is a generative 'site of production'—a transformative and 'dynamic force' (Watson, 2009: 11-12). The diagram then does not only concern the human subject: it concerns the 'force of becoming'. Genosko writes that with the diagram Guattari seeks to escape the interpretative, 'meaning'-driven search of more representational frameworks and the 'human and individuated subject' (Genosko, 2009:103). With this move Guattari 'separates the image and the diagram: the former belongs to symbolic semiologies, and the latter to a-signifying semiotics' (Genosko, 2009: 102).

A-signifying semiotics are those:

... that tune in directly to the body (to its affects, its desires, its emotions and perceptions) by means of signs. Instead of producing signification, these signs trigger an action, a reaction, a behaviour, an attitude, a posture. These semiotics have no meaning, but set things in motion, activate them. (Lazzarato, 2006)

In sum, the a-signifying concerns affect and situation while signification concerns meaning, content and perhaps also context (see also Genosko, 2009: 99-105). As an 'a-signifying semiotic' then, the diagram concerns the kind of 'trans-situational' affect emerging in *Intimate Transactions*. It renders it perceivable and felt (see Ednie-Brown, 2007; Massumi, 2011). However, as we have seen in *Intimate Transactions* the 'co-affective', constitutive

encounters are not only rendered perceivable and diagrammed in an image-world, they also traverse the different media forms. Engagement with the work is designed so that it involves a collaborative 'moving-together' of bodies and creatures that is diagrammed between screens, sound and felt vibrations. [23]

Intimate Transactions then provides a very complex series of diagrams of the 'relational potential'/force of the entire 'transactivity' between bodies and 'across situations' (Ednie-Brown, 2007: 327)—the two gallery spaces for example or the different 'screen environments'. [24]

We can clarify this further. The diagram has at least two sides. First, there is the more obvious 'diagramming' (Ednie-Brown, AG3, 2010) in the design of the work. This involves the diagrams that are created before the actual construction, along with the way that these morph into the energising structure of the work itself. Second, there is active 'diagramming' by participants within the work. The diagram in this sense is the affective coherence found in the ongoing transactions between *Intimate Transactions* as a work, and participants' (trans) actions, a literal 'diagramming' in situ. Of course, the lines between these numerous aspects of the diagram are sometimes blurred. Ednie-Brown suggests that 'the use of the word diagram can be confusing...but really the distinction is between diagram (charting/drawing) and "diagramming" (the act)' (Ednie-Brown in AG3, 2010). [25] *Intimate Transactions* is then a complex 'diagrammatic' work (see Deleuze and Guattari, 1987: 142; Ednie-Brown, 2007 and Munster, forthcoming). It is *diagrammatic* not only in the quite obvious way, expressed in the functional structuring of transactions in designing the work—numerous diagrams were drawn in this process (O'Neill, 2006: 40). It is also *diagrammatic* in the sense of the diagram understood as that, which collects the changing relations—'transactivity'—and keeps the potentiality of the work alive.

Overall, the 'diagramming' in *Intimate Transactions* engages relational encounters and 'transactivity' by operating within an intimate 'logic of affects'—thus Ednie-Brown's notion of the 'affective diagram'. A 'caring for belonging' emerges. This care—which is an ecological care tending to difference—is the very 'relational potential' *Intimate Transactions* 'tends-toward' (Massumi, 2011: 60). It is hoped that this care will follow us when we leave the gallery spaces.

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Biographical note

Lone Bertelsen (PhD) works across the fields of photography, art and visual studies; affect and subjectivity studies; and cultural and social theory. Her work is inspired by the more micro-political and generative branches of post-structuralist and feminist thought. Her writing has been published in *Theory, Culture and Society* and *The Affect Theory Reader*. She has taught at Macquarie University and The University of NSW, Sydney.

Notes

[1] The other members of the *Transmute Collective* are Lisa O'Neill ('performance director') and Guy Webster ('sound director') (see Armstrong, 2006: 16). *Intimate Transactions* was created collaboratively and involved the creative work of numerous other collaborators. For the names of all these collaborators see <http://www.embodiedmedia.com/#/page/intimate-transactions>. See also Armstrong's (2005) own article on *Intimate Transactions* published in the *Fibreculture Journal*.

[2] The work is now a part of the permanent collection of ZKM media arts museum in Karlsruhe, Germany.

[3] Jillian Hamilton also considers the ethical qualities of *Intimate Transactions* (see Hamilton, 2006: 129).

[4] Barbara Bolt writes that for Birringer (as for others) 'the critical element in *Intimate Transactions* is its capacity to raise questions to do with the ways we think about and intervene in the world through our (design) practices' (Bolt, 2008: 28).

[5] Zeljko Markov who designed the “shelf” explains that the ‘immediate challenge was to find a way of supporting the human body in a neutral position that’ was ‘not too familiar and yet not threatening’ (Markov, 2006: 45).

[6] Greg Hooper writes that ‘the whole system forms an ecology and we have avatars within the system: jellybaby angels or glowing discs floating submerged in a dark ocean’ (Hooper, 2005: 26).

[7] Italics my emphasis.

[8] Guattari explains that the “term collective” should be understood in the sense of a multiplicity that deploys itself as much beyond the individual, on the side of the socius, as before the person, on the side of pre-verbal intensities, indicating a logic of affects rather than a logic of delimited sets’. Guattari here also points to the ‘incorporeal Universes of reference such as those relative to music and the plastic arts’. For Guattari ‘[t]his non-human pre-personal part of subjectivity is crucial since it is from this that its heterogenesis can develop’ (Guattari, 1995: 9).

[9] Armstrong (2005 and 2006) gives a detailed outline of the ecological and ‘ecosophical’ commitments underpinning the design of *Intimate Transactions*. He draws extensively on the work of Guattari.

See also Genosko (2009) for a discussion of ecosophy.

Hooper writes that ‘[Intimate Transactions] continues Armstrong’s development of ecosophical praxis, used here as a pragmatic philosophical take on new media production that chucks out the techno-fetish and puts in a fusion of ecological theory and ethics. New media as experience design rather than commodity production’ (Hooper, 2005: 26).

[10] In her engagement with Simondon, Manning explains ‘that the force of affect resides’ ‘at the virtual-actual juncture’ and that it is affect that ‘returns, not the subject’ (Manning, 2010: 117-126).

[11] See also Birringer (2006) and Manning (2009).

[12] See Bertelsen (2004) for a discussion of this. See also Ettinger (2006).

[13] Italics my emphasis.

[14] It should be noted here that Genosko also writes that Guattari's 'choice of Eros entails the group subject, that is, a definition beyond the traditional dualities of society and individual, Eros and Thanatos' (Genosko, 2000: 156). Arguably *Intimate Transactions* also moves in this direction.

[15] Christoph Brunner and Jonas Fritsch (2011) have introduced the Simondonean concept of transduction into the discipline of interaction design and Fritsch (2011) has activated Massumi's concepts in a detailed (re)thinking of the discipline and affective 'interactive environments'. This work is very much in tune with the concerns of this article.

[16] Massumi could be thinking of *Intimate Transactions* when he writes:

'you've built into the operation shifts in emphasis from interaction to lived relation. You're creating ways of making lived relation really appear. You're operating on the qualitative level of thinking/feeling, where you are pooling styles of being and becoming, not just eliciting behaviours' (Massumi, 2011:52).

[17] Birringer points to how site-specific performance too was conceived as 'forming a situation' (Newling in Birringer, 2006: 107). He suggests that "'transactions" reverberate with much of what we remember in the history of live art in which bodies are placed in situations' (Birringer, 2006: 107).

[18] In the world of thinking interaction design Ednie-Brown and Mewburn suggest that laughter, and I would suggest with it the like of the grin of the Cheshire cat and the vibrations, are quite significant here (see, Ednie-Brown and Mewburn, 2006: 85-86). They keep the intensity of the relation alive.

[19] For Irigaray wonder is '[i]n us and among us' (1993:82). Wonder must always be '[f]aithful to becoming'. And it 'is an openness across, awaiting new insights' (Irigaray, 1993:75).

[20] In Ednie-Brown and Mewburn's (2006) terms *Intimate Transactions* vibrates with the 'relational potential' between us. If we follow Massumi, in this vibrating trans-situationality, causality becomes "relational" (Massumi, 2000a). Causality cannot be prescribed to any individual body or element of the work alone but emerges from a dispersed 'co-affective' movement.

[21] Anna Munster in her forthcoming book (*An aesthesia of networks: conjunctions of experience, media and art*) considers how networks experience. Simply put Munster argues (amongst other things) that such experiences and much networked art are diagrammatic, relational and affective. She draws on the work of Pierce, James and Deleuze and Guattari, amongst others. See in particular the chapter titled 'Networked Diagrammatism: from map and model to the internet as mechanogram'.

[22] See in particular Deleuze and Guattari (1987: 111-148); Deleuze (2003) and Deleuze (1986). See also Massumi (2002: 177-207; 2011, 83-103).

[23] Guy Webster explains that the *Transmute Collective* aimed to make the participants 'feel a part of' the work. He explains that this is something that is 'very difficult to do with a screen. But you can do it with sound...[t]he sound and the vibration, rather than the visuals alone perform that function' (Webster, 2006: 60).

[24] See Lisa O'Neill (2006: 40).

[25] Ednie-Brown (AG3, 2010) writes that 'Brian Massumi's "biogram" is usually what I mean when I talk of diagram (or "affective diagram")'. See Massumi (2002: 177-207). See also Ednie-Brown (2000) for a discussion of the diagram.

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FCJ-150 *AffeXity*: Performing Affect with Augmented Reality

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AffeXity

AffeXity is an enquiry into affect in cities, and a-fixity as an urban condition. It is an artistic research project, but really it is a set of overlapping practices: artistic practices of dance improvisation, video shooting, digital image editing and sound composition, combined with the daily practices of moving through a city and using mobile devices. Add to this bundle the applied technical research of developing applications for mobile devices and the practices of writing and reflecting on all of the processes, and you have an unwieldy assemblage. The entire project is animated by explorations of affect. It is in constant motion, exceeding both the artistic direction or conceptual coherence that attempt to structure it. [1]

This project opens implications for interaction design: designing affectively and designing for affect are two different things. It is possible to do the latter using processes and methods that are entirely un-affective, or in other words without affective sensibility. The opposite might also be true: it is possible to use an affective design process for objects or experiences that are not affectively noteworthy. With *AffeXity* we are composing affective processes for the production of an affective experience. We do not know yet whether they are effective, but it is very likely that 'effectiveness' is not an appropriate criterion for judgement.

At the heart of *AffeXity* is the convergence between performance and mobile technologies. In particular, the project uses the augmented reality browser Argon. This runs on smart phones and permits images, audio and video to be anchored in real world locations using geospatial coordinates or QR codes. The media float in the device's display over the live feed from its

camera. Appropriately for an augmented reality project, *AffeXity* is designed to have several layers, or modes, of interaction. In its simplest interactive mode, it is a locative media project with short movement improvisations videoed and geospatially tagged at various sites in Malmö, Sweden. These locative choreographies are shot in the location where they will be tagged, with the dancer improvising in a mini site specific performance. Once they are registered using GPS or QR codes, these embedded choreographies can be seen by people with mobile devices as they travel through Malmö in the courses of their lives. Whether it is an habitual route to work or walking the dog in the middle of the night, the choreographies can be downloaded and experienced at any time of day or night throughout the year as long as mobile coverage permits. These narratives can be as integrated into urban lives as crowds, buildings and buses, but perhaps offer an idiosyncratic 'shimmer' to experience, a play across presence and motion (Barthes, 2005: 101).

A more orchestrated option for interaction is for small groups to be led from site to site by a guide, in the style of a promenade performance. With multiple devices downloading and playing the visuals and sounds at slightly different speeds the group will provide their own re-mix of the media simply by being co-located while viewing. An expanded performance option is planned for occasions when a more complex mix of presences can be formally produced, as in the case of a festival: the same live performers from the media will be situated in the sites where the locative choreographies are embedded and projections on the urban structures will accompany the imagery and sound on the devices.

An additional performative layer for *AffeXity* takes it even further into the domain of social choreographies. This will occur when the project is promoted through social networking and other initiatives for contribution and participation by whoever desires to do so. Existing choreographies can be downloaded, remixed and retagged; new choreographies can be posted to exist in relation with others; sound, animation or text might be added, or other forms of embedded media might be offered. The exchange and circulation of affect through mobile devices happens all the time as we SMS, tweet and post to Facebook, but this project intends to foster an increasingly performative approach to media and urban living, broadening the choreographic patterns of daily life which risk being ever more controlled and narrowed. [2]

This paper is written at a fairly early stage in the research process, contrary to the conventional scholarly practice of reaching closure on a project prior to reporting on it from the clear position of hindsight. This is done for two reasons: the first is that our early phases of research already have revealed considerable tensions and insight into affect and performance both practically and conceptually; the second, more compelling, reason is that this project has an existence prior to its completion as an artwork. It may take years for

the piece to end (it will never be complete or closed) but from very early in the process it generated a fever of interest, with blogs and cultural organisations reporting it as existing, resulting in a flurry of demands on the part of festivals and producers to host it. Viewed from the processes of production and reception in the art world this caused uneasiness: almost provoking us to correct the misconception that it existed when in fact it did not yet, making us want to slow its public reception, to decelerate the project, until we could catch up with it. Viewed affectively there is no inconsistency. According to the Spinozan formulation of bodies that is increasingly cited in critical and philosophical writing, *AffeXity* exhibits the capacity to affect and be affected, and it has its own patterns of speeds and slowness. [3] As a construction, as a body, it exists apart from whether or not it is fully complete according to the art world, or indeed according to the artists. Closure is irrelevant. The project will always exist in a state of not quite, or not yet. From its inception, this project created a sort of affective cloud around it, almost a microclimate, that was palpable and circulating. And so I write and think about it, more to catch up with it than to explain it.

The content of this paper seems to flow in several directions at once (philosophical, artistic, technological, methodological...) so I'll take a moment to be quite pragmatic and indicate the path to be followed below. The discussion of *AffeXity* will be opened by referring to some of the philosophical currents around affect such as intensity, autonomy and contingency; then the AR browser Argon and the impact the technical development and the artistic processes have on each other will be considered. The middle section of the article will paint a picture of affect as it emerges from the actual practices that constitute *AffeXity*'s early phases of artistic research: dance improvisation, video shooting, image editing and choreographic direction. There is an affective turn in each of these practices that does not necessarily map onto the affective turn in theory; this will be explained by relying on descriptions from the moments of practice by Jeannette Ginslov and myself, the main artistic collaborators. The final section is devoted to outlining a methodological perspective emerging through this research. Calling it provisionally *affective sensibility*, it straddles practical and theoretical activities because it is used in the process of generating the movement and media at the same time as it is a way of engaging with theories of affect. It is a method for generating artistic and theoretical content. What will not be discussed in this paper is the actual implementation, reception or, to use a design term, the 'user experience' of *AffeXity*, for the simple reason that the project is not yet at that stage of development.

The reflections on affect and the description of the artistic research process in this paper can stand alone, but the intent is for them to contribute to a particular understanding of performance, that most 'promiscuous' of interdisciplinary practices and scholarly memes (Thrift citing Dolan, 2008: 124). Performance, in practice and theory, has sparked the interest of interaction designers, urban geographers, media studies scholars and architects in recent years. There is a sense that performance and the performative can shake the dust

off conceptual constructions that seem too antiquated to account for the convergence of disciplines and practices, or that they that can provide a level of dynamism, imagination or simply liveness to methods, workshops and practices. Speaking from the perspective of scholarly work in interaction design, performance is frequently posited as a challenge, solution or method, and then walked away from without much elaboration. On occasions when it is elaborated, the usual suspects of Richard Schechner (1988), Erving Goffman (1967) and Victor Turner (1987) are relied upon to emphasise aspects of anthropology, ritual or the performances of daily life. In this paper performance is triangulated across *bodily movement*, *emergence* and *shimmering*. Performance as emergence occurs out of the fissures in habit and codified behaviour; it is heavily influenced by improvisation. Shimmer is based on change, not just change in position but a ripple in affective content and a flicker in the force of habits: it is 'the shimmering field of the body insofar as it changes, goes through changes' (Barthes 2005: 73). Performance can be seen as a play between the escape and recontainment of movement, as 'a shimmer of forces' of bodies and of things (ibid, 54). Never an easy concept to pin down, this understanding of shimmer will be unfolded further below, in particular when movement and video editing practices attempt to avoid what is habitual and drop into the unexpected. Ginslov uses the metaphor of 'sniffing out' the movement she wants to capture on video, the scent of something that is out of the usual patterns. Performance as shimmering has relevance also to social choreographies, seen as the many minute actions, uncontrollable from a central source, of a multiplicity of bodies and objects.

Extending Affect

Affect is notoriously hard to define, and this can make writing about it seem precious or coy, particularly if clear explanations are avoided. Suffice to say that any definition is not going to fit, but take this one in good faith: affect is the passage of forces or intensities, between bodies that may be organic, inorganic, animal, digital or fictional. It is located in the domain beyond reason, logic or 'conscious knowing' (Gregg and Seigworth, 2010: 1) but is so much more than emotion or feeling. Emotions are a jumping off point for understanding affect, the common currency of affect (Thrift, 2010), but the swirl of corporeal, conscious and pre-reflective forces that make up affect exceed the narrower domain of emotions. Melissa Gregg and Gregory Seigworth offer an excellent overview of affect, they manage to provide just enough clarity but not too much, just enough poetry without becoming too ethereal; and crucially for me, they do not extract affect too far from bodily experience. 'Affect, at its most anthropomorphic, is the name we give to those forces that can serve to drive us toward movement, toward thought, toward extension' (Gregg and Seigworth, 2010: 1). Extension in space and time through mediation and mobility is a possible way of describing the basis of *AffeXity*, but this extension is more than the revelation over the past decades, beginning

with telematics, that we can be present in distant locations and be recorded and replayed in different temporalities. [4]

The extension relevant to current practices and discourses around technologies of presence and communication is more of a repatterning of the forces that make up our bodies and our lives. This repatterning is no longer just construed as movement extending outwards from a contained subject. Whether through recording and layering, or by means of the sharing, annotating and reposting of social media, this repatterning is not a vector: it is a complex choreography of extension and intensities, of externality and immanence. In designing and devising the performances that make up *AffeXity*, we are less concerned about the physical forms of bodies in urban spaces than the play of intensities radiating from and through people with their devices.

Extension and retraction are familiar biomechanical motions in most dance forms (*plié* and *tendue*, bend and stretch). In taking a choreographic approach to affect, *AffeXity* locates these actions in the wider flows of the extension, compression, radiation, dilution and multiplication of affect. These are not simply qualities beginning or ending with a solitary performer or recipient of media: extensive relations and intensive capacities are located in a shared domain. When Deleuze wrote that extensive and intensive relations are not just 'a matter of utilizations or captures, but of sociabilities and communities' he, of course, was not writing about Augmented Reality (Deleuze, 1988: 126). He refers to ethology, the study of relations between things. However, his ideas are useful in that mobile media is not merely about what we can capture or whether we utilize our mobile phones 24/7. Deleuze helps redirect our focus to the creation, destruction and recreation of different social groupings or extended bodies. [5]

Affective forces need not be forceful. They can be barely detectable shifts in relationality between ourselves and our built environments, or between bodies in urban spaces moderated and mediated by technologies. *AffeXity*, as a locative media choreographic project, explores a body's ongoing 'immersion in the world's obstinacies and rhythms, its refusals as much as its invitations' (Gregg and Seigworth, 2010: 1). In cities we encounter brick walls that refuse, and glass windows that invite; but equally the glass windows obstruct and the brick walls offer crevices for opening. The obstruction or invitation is not sustained, but the state of relations is. Affect is as much outside a body as within it, and ultimately clear distinctions between inside and outside no longer make sense.

Muddy autonomy

As important as it was in the 1990s to suggest that affect was autonomous it is now equally important to emphasise that it is not separate from situated, messy exchanges between dynamic bodies.

The autonomy of affect is its participation in the virtual... Affect is autonomous to the degree to which it escapes confinement in the particular body whose vitality, or potential for interaction, it is. Formed, qualified, situated perceptions and cognitions fulfilling functions of actual connection or blockage are the capture and closure of affect (Massumi, 2002: 35).

Brian Massumi's formulation has generated many reactions but they tend to fit into two currents. Some readers are prompted to let out a sigh of relief that they can escape the discourse of bodies, while others dig their heels in and emphasise that affect is still corporeal and situated. Instead of being forced to situate myself on one or the other side of yet another pernicious duality (that is, is affect free from or situated in bodies?) I prefer to ask what is meant by bodies. How are they constructed, composed and lived? I find it surprising, and quite revealing of a particular intellectual climate, how many people—media students, musicians, dancers, literary theorists, not to mention designers of games, software and services—are relieved and even captivated when they hear of a Spinozan approach to bodies. The relief comes from no longer being cornered into choosing between the meat or the abstraction, but being able to live with the combination as both necessary and contradictory. [6] I choose to interpret Massumi as creating a sort of undulating current between affect within and outside my body, possibly because I have a strong corporeal resonance with his assertion that 'Actually existing, structured things live in and through that which escapes them' (Massumi, 2002: 35). At the same time, I am wary that too much emphasis on autonomy falsely lulls us away from the awareness that we are corporeally impacted by affective practices. I breathe a little easier when I read Sara Ahmed's assertion, 'I do not assume there is something called affect that stands apart or has autonomy ...Instead I would begin with the messiness of the experiential, the unfolding of bodies into worlds, and the drama of contingency, how we are touched by what we are near' (Ahmed, 2010: 30). I appreciate the nuance of Eve Kosofsky Sedgwick and Adam Frank's writing on Silvan Tompkins, but as an artist attempting to work affectively I embrace even more their practical insights that, like it or not, affect is felt and that affective events afford the possibility not to be affected. They describe the act of reading Tompkins: 'At least as often as paragraphs permit reader and writer to do—here to enjoy but in other places to anger...—they permit one to not do' (Sedgwick, 2003: 96). This points to a latent political motivation for AffeXity. Urban dwellers are ever increasingly affectively

manipulated by political and economic forces without the scope to not be affected. This is echoed in another way by Thrift and Amin when they imply that we ignore affect at our peril (Amin and Thrift 2002).

Affect exists. It is a part of me and beyond me. Affect is really affects: they are shared, and shaped by me and by others. They seem to hang in the air, they live in the pit of my stomach. They do both at the same time. There are strings attached. Sometimes they come from the marginal movements of banal bodies. I absolutely cannot access affect without my body but it does not reside or originate or remain in me. Affect does not discriminate between age, gender, materiality or bit rate. It is perceptually polymorphous, and socially ambiguous. Beyond taste and judgements. Affect is and is not at the same time. It is excessive and beneath notice. It is performative, shimmering. The moment of affective emergence exists in between minute movements and decisions, in the tension and the flicker of motion.

Augmented Reality as Augmented Materiality

'Considerations of affect are impossible to decouple from those of materiality,' writes Susanne Paasonen. Materiality in her research refers to the bodies performing in and viewing pornography, but it also refers to 'the technological objects, protocols, networks, and platforms' involved (Paasonen, 2011, 8). Her argument can be mapped with ease onto the experimentation with augmented reality as a platform for the transmission of affect across bodies that themselves exist across layers of mediatization.

Argon, the augmented reality platform we use, is currently the first and only application to offer video as a layer, alongside text, audio, still images and the possibility for animation. [7] The development of AffeXity occurs synchronously with the development of Argon, prompting the question: Why work with a developing piece of software?

As hackers and improvisers have long known (since the days of experimentation between artists and scientists such as E.A.T. in the 1960s and the wave of technology and dance experimentation in London in the 1990s called Digital Dancing) when something is not quite finished it has an immanent quality of unfolding: we don't quite know what functionalities it will have or how these might be used. This echoes Spinoza's oft-cited words on bodies 'No one has yet determined what the body can do' (Gregg and Seigworth, 2010: 3). We

work with Argon because no one has yet determined what it can do. Like the performing bodies in *AffeXity* Argon is itself a body which exists in a state of potential. It is still being sketched, or to use Massumi's phrase it participates in the virtual (Massumi, 2002: 35). Two caveats need to be introduced to this somewhat utopian tone of immanence and potential, one pragmatic and one political. The pragmatic one is simple: when a piece of software is not yet completed it is buggy, limited and frustrating to use. It crashes. The interval between what you imagine it might do and what it currently does is what provides momentum to develop further, but that interval also taunts you.

The political caveat is that in our current social and economic climate very little software is created without already having a place in the consumer market. In their pamphlet on Urban Computing, Adam Greenfield and Mark Shepard accurately acknowledge that advertising is the biggest problem lurking behind urban computing (Greenfield and Shepard, 2007: 15-16). The projects they discuss enter into critical relationships with advertising and surveillance. Like most AR software, Argon is well positioned to serve the advertising industry, but it has some important distinctions. It is free, open source and operates according to open standards for web content. Further, the development team opts for breadth by emphasizing the potential for cultural heritage applications alongside more commercial ones and by working with artists to develop its potential for artistic use. No one has yet determined what this body, the non-human body of Argon, might do. Or what the bodies that are combinations of people, devices and software might do with Argon.

More specifically, it is worth asking what the *AffeXity* artists seek from Argon, if we could have any functionality at all? In terms of affordances, our desires are not surprising. We want from our mobile media devices what most people do: rapid downloading; a fairly intuitive interface; the ability to manipulate our video images; a capacity for annotation so that one choreography can be linked in AR space with others, thus creating a network of images commenting on each other. This wish list of functionality can also be expressed in the terms of affect: we desire the ability to slide across speeds and slowness in order to modulate how we affect and are affected. In other words we want to have vectors of gradience built into the augmented reality application, or the ability to shift visual or temporal intensities by subtle degrees. Sliders work far better than buttons (as any DJ knows) and we would like several: one permitting us to adjust the transparency of the images, one to dissolve the edges of an image by degrees, and another to shift the size and rotation of the images. All of these can be considered technological affordances for the transmission of affect, or 'durational indices of shapes, timings, rhythms, folds, and contours' (Gregg and Seigworth 2010: 13) but they do not end with image manipulation. These also return to Paasonen's multiple designation of materiality by introducing the materiality of perception and the texture of the images (Paasonen, 2011: 8). These are our desires, but they are a long way from being implemented. We are in the midst of that most

familiar but not-so-often-written-about phase of the technological 'work around', finding ways to work around limitations.

The actual locative component of locative media needs to be reflected upon further. Geo-spatial tagging is not a new technology, but what happens when the tags are heavily populated—when multiple images need to inhabit a GPS location? Like densely populated cities, the layer of augmented reality itself contains layers. It should be called augmented realities. The plural form invites the choreography of parts, or 'relation as rhythm to account for the passage of intensities between bodies, or bodies and world (Gregg & Seigworth, 2010: 13). Or the term Augmented Materiality would do: AM instead of AR. Deeper discussion of locative aspects will wait for a later paper once we deal with this phenomena more tangibly. Right now it is still speculative for us but we can see where current discourse stops short. For example, does AR have to be about the clear framing of media in our devices and legible insertion into cities? Or can it be used as a mode of peripheral vision, as considered by Juhani Pallasmaa in his reflections on architecture when he writes that what is missing from our dwellings today are the potential transactions between body, imagination, senses and the environment (Pallasmaa 2004)? Can we go beyond the 'choreography of sensations,' a formulation by another architect critically questioning his field, toward a performance of affect (Haque, 2003)?

An Inventory of Shimmers – exploring the process

Here the focus shifts to descriptions of the actual processes of performing affect. As such, this section is 'an inventory of shimmers, of nuances, of states, of changes' (Barthes, 2005: ,77), revealing degrees of gradience between speaking from within movement and reflecting on movement. This 'inventory' can be seen as an accumulation of raw affective data from experience obtained by applying the method of affective sensibility. It can also be seen as an "affectual composition" (Gregg and Seigworth, 2010:11). The usual structure of scholarly writing is inverted (or contradicted) because the data in this section is presented just prior to the articulation of the method in the final section. Echoing the discussion above, this can be seen as a 'necessary contradiction', respecting the fact that the methodological perspective emerges at the same time as the artistic material. In the paragraphs below JG and SK are used to indicate the words of Jeannette Ginslov or Susan Kozel. We write and move in such a way as to explore the small shifts of affect as they make themselves felt in motion, perception and aesthetic habits.

Movement improvisation: 'Where to start?'

SK: *How do I even begin to think about working with affect? For so many years the improvisatory focus was on kinaesthesia, on corporeality and embodiment with all its multiple voices in motion. Here I stand in a city about to begin a movement improvisation. Where to start? I attempt to start from somewhere different from my usual starting points: I try to inhibit my habits. I have an inkling that I usually begin a kinaesthetic trajectory by releasing my arms and letting my hands travel, leading my body, at the same time as softening my knees letting my spine create a different torque. Now I decide to reframe the starting point: can I let affect lead me rather than motion?*

I want to move less and sense more. Sensing is not just an internal focus, it radiates outwards. When an affective state arises and is not fought or tampered with it acts as a window: as the mover, I can choose to notice this window and pass through it.

Of course the entire notion of a 'starting point' is awkward and forced because dance is a pattern that occurs all the time. Improvisers of movement and music have a practical understanding of Deleuze's assertion that 'it is by speed and slowness that one slips in among things, that one connects with something. One never commences; one never has a tabula rasa; one slips in, enters in the middle; one takes up or lays down rhythms' (Deleuze, 1988: 123).

Yet, when working with media that begins with video capture there is a starting point, or at least a threshold: it is when Jeannette tells me the camera is rolling.

JG: *I am very aware of the task at hand: the desire to capture the affective gestures that the dancer is performing far outweighs the capture of movements or choreographies. I relax, breathe, but I am alert to all the subtle nuances. I try not to think too much or direct too much. This direction is a gentle persuasion. The dancer needs to sniff and tease these out by exploring her somatic connection to the space she is performing in. We do not think of dance, steps, counts, but enchainements of affect. There may be a score that is decided upon, something to work on. The dancer and I enter that resonant space. When I feel it is there, I hit the record button.*

This is a subtle variation on improvisation because improvisation is about suspending conscious judgement and letting the flow of inner or outer stimulation direct the flow of movement, talking, singing, reacting, making and creating. It has some relation to contact improvisation. Contact improvisation has been characterized as cultivating alertness 'in order to work in an energetic state of physical disorientation.' [8] In other words, improvisation is not just about fluidity and synchronicity. Consideration is given to inertia and disorientation, gravity and temporality, how contact with the ground, others or oneself may be varied, sporadic, and inconsistent but is all the stronger because of these qualities (Kozel, 2012).

SK: *In this particular improvisation I am standing in front of a lighthouse in Malmö. It is sunny and cold. People are passing close by, for this lighthouse is near a drawbridge leading to the ship building yards close to the university and many other buildings. What is the affective window? It is a combination of impulses from inside and outside: I bend my knees and fall over the railing wanting to dissolve into particles at the same time as turn to water on the stones. There are emotional overtones, but the affective state is more than feeling tired or a little anxious or happy to be outside in the air as the seasons change. I can't quite capture it, or seem to slide in and out of different affective currents. There are traces of the social urban environment for the presence of the two observing tourists and the cars, bicycles and trucks passing. Suddenly I am more aware of what is going on outside of me than inside: the tourists begin to stage their own performative shoot, letting themselves become more adventurous in how they use their bodies as they are co-located with us using our bodies in a way that is clearly for a film or art project. Two workers see me slide down the concrete slope to the rocks and water below and ask, partly humourously, partly in earnest, if I need help. The affective state is made up of the emotional, physical, social, environmental and meteorological.*



Video still from shoot at the lighthouse in Malmö. Photo Jeannette Ginslov.

<http://www.youtube.com/watch?v=2Gf7ohn5SY8&feature=youtu.be>

AffeXity Phase 02 Lighthouse 01

<http://www.youtube.com/watch?v=ywfSTKEC3KI&feature=youtu.be>

AffeXity Phase 02 Lighthouse 04

(The online version of this paper includes embedded video as cited above and is published at <http://twentyone.fibrejournal.org/fcj-150-affexity-performing-affect-with-augmented-reality/-ed>)

A way of understanding the different movement patterns in AffeXity is to say there is a shift from patterns to 'feeling tones,' to movement qualities or 'atmospheres' (Seigworth & Gregg 2011: 2). This is why the cloud is an apt metaphor, not for the usual connotations of invisible data clustered around our heads, like a swarm of bees, but because clouds can be damp, dense, light, ridged or bubbly. Passing through a cloud or carrying one around with us cannot help but be affecting on the levels of sensibility, thought and motion.

Watching the images from the lighthouse shoot, I see how 'in my head' I was struggling not to direct, but instead to release the tendency to control and direct movement. Jeannette too, when presenting this section before a small audience paused and said 'it's not quite right, it is not quite ... there.' [9] Of course not. Affect is never there, it implies an "extreme changeability" (Barthes, 2005: 101). Artistically there is the possibility that the images and sequences will never feel complete or quite right. At the time of writing this article we are still in the early stages of developing an improvisational approach but there is a possibility that when the motivating forces are affective there will never be a coherent aesthetic quality to the movement. It will always be about disorientations and attunements, in perpetuity, in and out of one's head. This is what makes this project especially suited to social choreographies, rather than the vision of an artist or collaborative team, where social choreographies are the multiple minute actions of a myriad of bodies, undirected by a central source (Kozel, 2010a). This project needs to live in the wider domain of social networked media, constantly being raveled and unraveled, ignored or obsessed over, by many people according to the different rhythms of their lives and bodies.

SK: *And next thing I know I am draping over the barrier and floating upward again, my body is moving of its own accord. I feel like a strange bird at the same time as embed the cold metal into my lower abdomen. The improvisation takes me into a standing arc with arms slicing the air, and reaching back with bent elbows. My back is important again. I realize, perhaps for the first time that when improvising vision shifts: no longer central and frontal, all visual processes seem to be peripheral, sensing in the round.*

Video Capture : Intensities and Resonances

With AffeXity the capture of movement on video is done with care, always with an awareness of what Pallasmaa has called the danger of reduction to a 'retinal journey.' He writes of architectural design and how 'computer imaging tends to flatten our magnificent, multi-sensory, simultaneous and synchronic capacities of imagination by turning the design process into a passive visual manipulation' (Pallasmaa, 2005: 2). Expressed differently, escaping the retinal journey is an escape from an ocular or representational approach into what Nigel Thrift has called the non-representational (Thrift, 2007). This impacts the processes of video shooting and editing in particular: at the same time as being image-based, the desire is to construct, edit and choreograph the images and media in a non-representational way. We are only just beginning to feel our way into using video-non-representationally. Some might say this process is doomed because images are always representational and that we would be better off simply using sound. Instead of migrating to sound, however, we work with resonance. Our non-representationality comes out of an approach to trusting the emergent moment of improvisation rather than framing the image. This invites an entirely different series of 'bindings and unbindings, becomings and unbecoming' (Gregg and Seigworth, 2010: 4). In other words, we try to permit one movement—of camera or body—to lead to another according to a different logic or intuition from most video practices. Following Thrift in his detailed writings on movement, or 'the geography of what happens,' non-representationality also rests on an oblique capacity to see something that is not there, or is not yet there (Thrift citing Castoriadis, 2008: 2 and 111). We suggest that AffeXity offers an additional take on non-representationality, found in the complexity of an assemblage: the piece (call it a locative choreography or an AR performance) only exists through a combination of actions, perceptions and technological affordances in any given moment. Even if we wanted to control the representation more carefully the many components would pull apart our intentions.

JG: *I shoot. I remain calm and breathe. I shoot from my centre as if in a contact improvisation with the dancer and the affective gesture. I try not to direct too much, but rather express an allowance to the dancer, an open space in which to explore affect. I can sense it immediately when it is there. All the wires, plastic, glass and metal of the technology melts away.*

The shoot becomes very subjective and I am patient. I wait if the affect leaves the dancer or the resonance is not there. I try again to find a somatic connection with what is being captured by the lens. My eye, the lens and my body's centre always trying to connect with the affective resonances before me. My legs are the tripod. My lens is my eye. My centre is alert and all three are connecting.

This connection is a space that is very particular, a condensed vision of what I really see before me, that is the dancer in the environment. I have to 'zone in' on the resonances and 'zone out' the environment trying to capture the same intensities and resonances the dancer is sensing. I use my screendance and choreographic technique subconsciously, allowing it to guide these short moments of intensities.

These subjectivities were never discussed but rather moved out in affective gestures and movements, leaving trails, suggestions and a semiotics of ineffability that can only be traced in affective gestures.

I try to remember the Dogme principle of: 'what you see is what you get.' I now add: 'what you feel is what you get.' [10] The screendance genre becomes the perfect medium to capture these states of affective poesis.

<http://www.youtube.com/watch?v=umlCMJ7Numg&feature=youtu.be>

AffeXity Phase 01 #1 Carlsberg

(The online version of this paper includes embedded video as cited above and is published at <http://twentyone.fibreculturejournal.org/fcj-150-affexity-performing-affect-with-augmented-reality/> -ed)

Editing Process: Rhythmic Attunements

Technologies provide constraints and affordances—all of us know this—but technologies that are in development provide an entirely new mix of constraints. As discussed above, Argon is a rapidly developing augmented reality browser that now supports video, but it is still rough and the devising period discussed in this paper coincided with very limited video functionality. Our visual aesthetic was layered, fleeting, ethereal but also stark and geometric. Being able to play with layering and opacity are of extreme importance to us. This corresponds with a certain aesthetic in Screen Dance that Ginslov is known for, but also reflects our emerging affective sensibility: for AffeXity it is important for bodies to be multiple and shimmering at the same time as merging with the built environment. Our affective sensibility far outstrips what the browser can support. Our artistic research process consists in moving and waiting at the same time.



Multi layered edit of Wubkje Kuindersmaa improvising in Copenhagen. Photo Jeannette

JG: *There is no shot list, no script and no narrative, no psychological development of a character in a location and linear narrative. In the edit process one uses a montage structure. One intuitively trusts the choices, the pace, rhythm, timing and cutting all connecting to the score or affective gestures and states of being expressed and captured. My job is to amplify that, cutting out all other extraneous information. I try to achieve this without too much intellectualization. I try to amplify affect and movement through the edits and overlays. If it is present it is there. It was a good take. Both camera and dancer worked in harmony. Sometimes if there was a good connection during the shoot, the video practically edits itself. There are no special effects required.*

However sometimes the intellectual processes need to surface in the edit. I need to shape the affect. I need to amplify the affect. I use layers and shots of the dancer in a moving lift, dancing in a stairwell and outside against a building. I layer these takes and make the moving images transparent. I amplify the dancer's face, her looking sublimely upwards, her hands trying to reach for spaces and moments that are escaping. She seems ethereal, in a dream state. The edit needs to reveal this in a non-linear montage, as if she were in a loop, in a lift forever reaching and moving skyward. She is in the lift, the building, the stairwell, the area outside – the lift, the building, the stairwell and area outside are in her. They merge.

Directing Movement: Dislocations and Orientations

Here we return once more to the limitations of working with an AR application that is in the process of being developed. Ginslov and I wanted the video to be a layer over the display of the mobile device, and for the edges of the frame to be incremental or soft, but were presented with postage stamp images. [11] In order to get past the problems with inserting video into Argon, the engineers requested that we provide them with video footage that was shot in green screen, with the background extracted. Suddenly we found ourselves working in a way we did not want to work—this project was all about movement embedded in the city not about shooting movement in the dislocated and decontextualised environment of a studio with green walls and floor. Green screening also did not coincide with our affective visual aesthetic because it tends toward the insertion of a clear edged 'sprite' into the environment. Despite this, the strength of a good artistic-technological collaboration is the willingness to modify practices in the interests of development, so we set up a green screen in a studio and worked with dancer Niya Lulcheva. This posed unexpected challenges from the perspective of choreographic direction: how is it possible to direct a dancer into an affective state, to initiate flows of affective exchange that result in movement improvisation when you are standing behind a camera and she is standing on green cloth in an extremely cold room with cement walls and floor?



Green screen experiments with Niya Lulcheva. Photo Jeannette Ginslov.

(The online version of this paper includes embedded video which is available at the URLs cited below- ed.)

<http://www.youtube.com/watch?v=oH6wj-GghcY&feature=youtu.be>
(green screen no chroma key)

<http://www.youtube.com/watch?v=61V8xu3Pozk&feature=youtu.be>
(green screen after chroma key)

<http://www.youtube.com/watch?v=0hNKga4d8iw&feature=relmfu>
(first mock up of possible AR effect. Note that this was only a test.)

JG: *The merging with the environment, spaces or buildings one can imagine oneself occupying became the central and most evocative means to find the scores within which Niya had to work. She was not in a location but working in a studio in front of a Green Screen. We tasked her to dance as if in a space, a location, a building.*

At first she performed and danced from an exteriorized perspective. Her dance was large, projected and danced as if performing on a stage. We needed to guide her into interiority, a subjective presence, in order to get the affect we were looking for.

The interiorisation of the space she was imagining herself to be in only became obvious and affective when we asked her to blend into the building: not just move in the passageways, the negative spaces, the passageways that we normally occupy and move around in. We asked her rather move in its echoes, its mortar, its bricks and in its cement.

With that her focus became inward, her dance became affective gestures, traces of memory and echoes of her internal vision. She was "in the zone" in the "vibe" of the place. She no longer had to project outwards, but allowed herself to transpire in the journey, her gestures became the echoes, the mortar became liquid and the building she was in, was in her.

She had connected and I had shivers watching her do this. The affect had been passed into me. Her internal journey travelled into me via the wires, metal and plastic of the techne and technical. The affective had transcended the technical, the machinic and become poetic, visceral and liquid.

This inventory of shimmers charts the nuances and changes in practice that make up the early processes of AffeXity. The metaphor of shimmer lends itself easily to speaking from the fleeting, never fully defined, relational moment of practice, but I want to call attention to the dynamic of the shimmer as a tiny moment of rupture. This moment of fissure produces an inkling that things might be different, and out of it a subtle change is enacted. A tiny change like this, whether it is in moving differently, using a video camera in an unconventional way or managing to coax a dancer into an improvisation that yields unexpected qualities, is an example of the shimmer of performance. Changes or shimmers point to a state of emergence, rather than seamless, circular repetition.

Affective Sensibility—A Reflexive Methodological Practice

Here I will sketch the development of a particular understanding of performance that comes directly from the performance of affect in *AffeXity* [12]. I rely on the following stepping stones in my path: first the Austinian performative speech act, next the performative potential of description, followed by the performative emergence of non-representational actions. The result is a rough triangulation of performance across bodily movement, emergence and shimmering. The bodily movement keeps performance grounded in corporeality, but this is already a transformed corporeality in the mode of Spinozan bodies—of speeds and capacity to affect and be affected—that is also the mode of our contemporary urban bodies. The emergence is the crucial constructive or generative aspect of performance. The shimmering plays an unusual role, drawing attention to the fissures or uncertainties of affect out of which something new can arise. Perhaps this *understanding* of performance, which is also a *practice* of performance, is only really relevant to the performing of affect and will provide only a fragment to the more general consideration of performance in interaction design and mobile media. Even if this is so, it will be consistent with the attention to affect occurring through ‘microscopic fragments’, the ‘filings of affect’ (Barthes, 2005:101).

The Performative Potential of Description

Austinian performativity is about how language constructs or affects reality rather than merely describing it, and it was influential to the development of gender studies and queer studies in the 1990s. It is not directly about bodies or movement, but embedded in it is what we might now call emergence, or a generative potential—an ontological dimension of bringing something into being that was not there previously. On an intuitive level, I believe this is why so many designers are attracted to the notion of performance, combined with the ease of integrating the social, critical and ludic into performative practices and concepts. Sedgwick identifies several features in Austin’s explicit performative utterances, examples of which include: ‘I promise...’ ‘I dare you...’ ‘I apologise’ ‘I give up...’ ‘I forgive...’. They are in the first person singular; they are present tense; they are indicative and active; the verb in each one names the act (Sedgwick, 2003: 3). I would also call attention to a certain affective intensity that accompanies the verb.

Is the performative lost when assertion gives way to description? Sedgwick makes the provocative claim that the performative, or productive, aspect of language is most revealing when the language is closest to claiming a simply descriptive relation to reality (Sedgwick, 2003: 5).

The provocation lies in the generally held assumption that description is a weakly mimetic form of language, offering little scope for fissures out of which anything new or productive can emerge. But this is not so. As someone who has, for many years, explored the convergence between thick description and dance in a phenomenological vein, I see how the performativity of the linguistic description works hand in hand with the performativity of movement. Both create openings, both are actual shifts to new grounds for thinking, acting and being. Linguistic descriptions of lived experience and movement improvisation—which can sometimes read like fragments, aphorisms or even poetry—do not point to the possibility of something new; they are that crystallization or transformation of something that was previously virtual into being. Affective description can move us to a different state of being. Witness your own reaction when I say ‘I breathe...’, ‘It shimmers...’ Language operates on a somatic level. While an elaboration of somatics is beyond the scope of this short section on performance, it is enough for now to say that somatics shares the field with affect. This is illustrated in Sedgwick and Frank’s description of the experience of reading Tomkins.

a potentially terrifying or terrified idea or image is taken up and held for as many paragraphs as are necessary to “burn out the fear response,” then for as many more until that idea or image can recur in the text without initially evoking terror. Phrases, sentences, sometimes whole paragraphs repeat; pages are taken up with sentences syntactically resembling one another (epistemically modal non-factive utterances of the form “It is possible that...,” “If ... may ...,” “Whether because...”), sentences not exemplifying a general principle but sampling—listing the possible. This rich claustal writing nurtures, pacifies, replenishes, then sets the idea in motion again. Bambi isn’t the only terrified wild thing in this picture. (Sedgwick and Frank, 1995: 95).

The Performative Emergence of Non-Representational Actions

Enquiring into the quality of emergence in performance, it is also useful to explore Thrift’s extensive writing about dance, performance and movement in the context of non-representationality. He finds in Deleuze a sense of ‘the speech act radicalized, made into a tool of maximum modulation and push through which new modes of existence can be glimpsed, even actualized’ (Thrift, 2008: 132). With the practices that make up AffeXity, performance as emergence occurs out of the fissures in habit and codified behaviour. This is the shimmer, ‘the shimmering field of the body insofar as it changes, goes through changes’ (Barthes, 2005: 73). Performance is a play between the escape and re-containment of movement, perception and affect. In that tiny gap there is the opening for the unexpected. There is risk, a risk that the performance may fail (Thrift 2008: 137), or that nothing new may come out of it. Emergence is an openness, not a guarantee of results. It is ‘a shimmer of

forces' (ibid, 54) that may or may not produce. A shimmer is distinct from a judder, a shiver or even a ripple. It is not just a kinetic oscillating pattern, but a particular combination of kinaesthetic, perceptual, imaginative and affective that has a quality of unpredictability or magic. Like performance.

Performance in *AffeXity* has an important dual role: it is a way of generating content and also a way of reflecting upon theories around affect. It is very close to improvisation, and some may read the emerging qualities as being more appropriately located in improvisation, but the context and many layers of *AffeXity* necessitate the slightly wider lens of performance. These many layers are also practices in themselves: dance, software design, social participation, and media production combined with the production of events. The affective turn in each of these practices does not map onto the so-called affective turn in theory. In short, the affective turn as it is applied to theory runs the risk of implying that prior to the turn materiality was lacking (Paasonen 2010). The affective turn in *AffeXity* involves subtle transformations in movement improvisation, video capture and editing, letting them be more liminal and less consciously directed. We have not fully formulated our approach, except to know already that it can never be a formula. It is therefore with some hesitation that I have approached the topic of method or methodology. Yet it is important at the moment in practice-based research in the arts and design to pose methodological questions and to craft new, hybrid or specialised methodological approaches that are rigorous and radical yet respectful of tradition, practices and materiality. [13] Equally it is clear that a dogmatic approach to methods is a limitation: the goal cannot be to produce a set of steps and to imply that good research is produced simply by following them. With that in mind, what I offer is more of a reflexive methodological practice, than a fully established method. I call it *affective sensibility*.

Shimmer versus Free Fall

There is a sort of circularity, or reflexivity to the implementation of affective sensibility: it is based on improvisation that comes from affect at the same time as seeking to reflect critically on affect. This approach invites the observation that encounters with theories of affect feel like a 'conceptual free fall,' possibly because 'affect emerges out of muddy, unmediated relatedness,' (Gregg and Seigworth, 2010: 4) of processes already underway or simply because it finds its ground in movement rather than stasis (Masumi, 2002). With *AffeXity*, we improvise in order to call attention to the shimmer, the changeability of bodies and motion in urban spaces. Affective sensibility is similar to what Barthes calls the 'hyperconsciousness of the affective minimal' (Barthes, 2005: 101) but it is not simply a cognitive state as it emerges and flows through the body in motion. The shimmer is easily

taken to be multiple fragmented, a series of micro changes, or mini-ruptures, but it is also an antidote to a sense of unrestricted or homogeneous free fall. For small ripples also provide toe-holds or tensions resulting in changes of direction, pauses for reflection or impetus for further movement.

As a practice embedded in the moment of affect, affective sensibility is concerned with both philosophical reflection and the development of artistic work. It is a complexified approach to first person experience, because corporeal experience is given voice, but the locus of experience is dispersed and decentered thereby transforming first person narratives into narratives from affective bodies. These bodies are composed and decomposed by the technologies, the environment, the corporealities and the intensities that traverse them. As a methodological approach it can only be understood dynamically. Affective sensibility, as an approach to knowledge construction and research processes, recognizes that the artist-designer-researcher is not always in an external position to analyse affect—and sometimes the best way to understand its flux is from an immanent position: from the midst of and emerging out of.

‘Who does not want to believe we live in a world ceaselessly recomposing itself?’ (Gregg and Seigworth, 2010: 13). Choreography is about composing actions, bodies, affects. Social choreographies are about recomposing them, mediating them with our lives and our many devices. In dark and confusing times there is a degree of optimism to be found in the theoretical stance that opens up scope for composing, decomposing, recomposing urban spaces. Yet even more than optimism, there is breathing space created in actually doing it. The performance of affect is an escape from paralysis, inertia or the one-sided position of being affected. All of have inventories of shimmers based on the practices and navigation of daily life; applying the awareness of affective sensibility might allow us to notice them. Then we have to decide what to do about them: are these the inventories we necessarily want to accumulate and carry around with us? In a way, this paper is less about the *What Is* of affect than it is about the *How To* of affect, as we grapple with it in the midst of artistic and social processes.

Biographical Note

Susan Kozel is a choreographer and philosopher working at the convergence between dance and a wide range of sensing and mobile technologies. She is a professor of new media with the [Medea Collaborative Media Initiative](#) and the School of Arts and Communication at Malmö University in Sweden.

Notes

[1] A project that integrates arts and technologies on this scale is necessarily a collaboration of researchers from several domains: Jeannette Ginslov shoots and edits the images based on her many years as a creator of screen dance; thus far two dancers skilled in improvisation have worked with us, Wubkje Kuindersmaa and Niya Lulcheva; Jay David Bolter of the Augmented Environments Lab at Georgia Tech in the USA provides critical and technical expertise and is a member of the team leading the development of the augmented reality browser, Argon; Timo Engelhardt has experience developing media for apple devices; Maria Engberg of Bleking Institute of Technology in Sweden and the Augmented Environments Lab, Georgia Tech, is actively involved in projects using Argon for cultural heritage projects; and Karolina Rosenquist of Medea, Malmö University is a specialist in innovative approaches to audience development. I take on the hard-to-define role of artistic director by working on a conceptual level but also in a performative mode so I can experience the affective exchanges of the project in as many ways as possible. This artistic research project is located at the Medea Collaborative Media Initiative at Malmö University in Sweden. Information on the project can be found at <http://medea.mah.se> and www.affexity.org.

[2] Related projects intending to create networked dance improvisation through Twitter includes IntuiTweet (see Kozel, 2010b, and Kozel, forthcoming 2013), Alone or Not (<http://www.aloneornot.org>).

[3] From Gilles Deleuze's book on Spinoza: 'Every reader of Spinoza knows that for him bodies and minds are not substances or subjects, but modes. It is not enough, however, merely to think this theoretically. For, concretely, a mode is a complex relation of speed and slowness, in the body but also in thought, and it is a capacity for affecting or being affected, pertaining to the body or to thought. Concretely, if you define bodies and thoughts as capacities for affecting and being affected, many things change. You will define an animal, or a human being, not by its form, its organs, and its functions, and not as a subject either; you will define it by the affects of which it is capable. Affective capacity, with a maximum threshold and a minimum threshold, is a constant notion in Spinoza' (Deleuze, 1988: 124).

[4] It is also more than the Cartesian corporeal substance of *res extensa* which was defined in relation to *res cogitans* (mental substance) and god.

[5] There is more to be said on the topic of intensities, but for now the scope for theories of intensity to take discussions of media beyond mere use-value or capture—'utilizations or

captures' (Deleuze, 1988, 126)—had to be stated, even if briefly. For further discussions of intensity see (Massumi, 2002), (Bertelsen and Murphie, 2010) and (Guattari, 1995).

[6] Donna Haraway in her seminal 1988 essay on situated knowledges called the task of overcoming pernicious dualities, such as that between matter and mind, both necessary and contradictory. Designers, philosophers and artists are still coming to grips with many necessary contradictions and contingencies at the present moment. It is useful when confronted by dualistic reactions or choices to argue for both/and as 'a necessary multiple desire' (Haraway 1988, 579). In a related move, Roland Barthes locates his Neutral in 'both at once' or 'at the same time' and calls it a 'structural U-turn' (Barthes, 2005: 190), and Quentin Meillassoux's *After Finitude* addresses the necessity of contingency (Meillassoux, 2009).

[7] More technical specifications on Argon can be found here <http://argon.gatech.edu/>. It is freely available through the Apple App Store.

[8] See Contact Quarterly's site for material on contact improvisation: <http://www.contactimprov.net/about.html> and Kozel 2012 for a discussion of improvisation and social aesthetics.

[9] These words are from Jeannette Ginslov's Medea Talk in May 2012, <http://medea.mah.se/2012/05/medea-talks-presents-jeannette-ginslov/>

[10] Dogme refers to the approach popularised by the Dogme 95 collective of which Danish film director Lars von Trier was a member.

[11] Currently Argon only runs on Apple iPhone and iPad, but plans are for it to be released for more general use on smartphones and tablets.

[12] This differs from my earlier situating of performance as essentially a hyper-reflexive action: if one sees something as a performance, then it is a performance. This was a reading of Schechner through Merleau-Ponty's relation of reversibility (Kozel, 2007).

[13] Affective Sensibility, as a methodological approach, exists alongside two others: Embodied Imagination (Hansen and Kozel, 2007) and Intuitive Improvisation (Kozel, 2010b). These 'sister methods' attempt the following: to open up approaches to practice that reside in a convergence between theory and practice; to place particular emphasis on bodily or tacit knowledge; and to call attention to a diversifying of methodological approaches in academia.

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FCJ-151 The modulation and ordering of affect: from emotion recognition technology to the critique of class composition.

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Introduction: ordering affect and the question of labour

Recent developments in the workplace have seen the intensification of methods to elicit and capture value within and across the affective encounter, notably through the introduction of technologies to measure the production of emotion by service workers. One of the most compelling examples of such methods is the 'smile-scan' – a technology developed by Japanese company OMRON to read and measure the intensity of facial expression in the workplace. Through an analysis of the use of OMRON's OKAO Vision smile scans in workplaces, this paper seeks to understand the insertion of particular affective technologies into the technical composition of capital and their role in the ordering of affect.

In the post-Fordist condition, the role of affect has emerged as a central point of contestation, since the capacity to produce relationships and feeling is pivotal to the work of service, communicational and relational industries. Autonomist Marxists [1] in particular have pointed to the importance of affective labour in contemporary forms of production and circulation. Surprisingly, however, these theorists have paid very little attention to the new technological infrastructures that shape and modulate the production of affect in the workplace. As a consequence, their understanding of the affective conditions of post-Fordist labour neglects to explore the ways in which the technological composition of capital intersects with and informs the question of class composition. This paper revisits and complicates the insights of autonomist Marxism by examining the technological nexus which organises and compels affective labour as a force in the production and circulation of value.

The critique of the technological nexus and composition of affective labour will explore the inclusion of affect within processes of HCI on the one hand, and the modulation and ordering of the affects of the user, on the other. The 'turn' to affect in computing and HCI design has opened up a vast field of research and potential applications (see for example the collection Tao and Tan, 2009). This paper focuses on just one of these applications - namely emotion recognition technologies that seek to subordinate user affect to the imperatives of capitalist valorisation (productivity, rapid circulation and accumulation). In so doing I aim to identify how, within HCI, certain technological assemblages come to compel the body of the worker within a particular ordering of affect. The ordering of affect occurs both in the process and as the effect of the use of particular affective HCI technologies in the workplace. In pursuing this line of inquiry into the ordering of affect, we will be better placed to understand contemporary elements of the technical composition of affective labour as expressed in affective HCI. The use of OKAO Vision as a technology of work perfectly captures the tensions inherent in the relationship between user and computer, affect, emotion and technology. The smile-scan is a technology for the ordering of affect *par excellence*.

Eva Hudlicka (2003: 3-6) provides a useful overview of the potential applications of HCI technologies focused upon user affect. Within a larger taxonomy of applications, she identifies one phylum of technologies that aim to sense, recognize and modulate user affect. In Hudlicka's words, such technologies might be deployed, amongst other possible uses, for '*maintaining a particular user state for a particular task*' and for *inducing a particular affective state in the user* (5; emphasis in original). Both of these applications are characteristic of the use of smile scans in service work, in particular, and the monitoring of affective labour, more generally. Moreover, both of these applications point to the sometimes very fine line and indeed the tension that exists between affect and emotion. This tension is developed below, but briefly now, affect here is understood as a relationship of varying degrees of intensity between bodies, and the impact of this relationship upon the bodies involved. However emotion is taken to mean the emotional quality or disposition of an individual at a given point in time. Emotion relates purely to the individual. The examination throughout this paper looks to the position of affect within HCI used as a force upon labour, and which orders the affects of the user as a technology of work.

Paying attention to the uses of HCI in the contemporary labour process, this paper will argue that technologies such as the smile scan form a point of refraction that articulates affect in a similar way to which a prism impacts upon light waves, shifting their flow, direction and speed. Although refraction does not change the substance of affect, it does alter the rhythm of movement and the perception of the flow. In this respect, we can engage the problem of affective labour and technology in the Spinozist terms of movement and rest, speed and slowness. Tension emerges as affect qua activity and labour moves through different spaces,

constituted by different logics and codes: value's organisation of labour determines a degree of movement or rest of a body and affect particular to the imperatives of valorisation. Here the deployment of a technological infrastructure to induce and maintain an affective state in a worker, mobilised within the logic of valorisation, forms the prism that compels and bends the affective encounter.

Posing compositionist problems

The perspective of compositionist analysis first emerged within the Operaismo movements in Italy during the 1960s, and has continued to develop in subsequent decades. The journals *Classe Operaia* (Working Class) and *Quaderni Rossi* (Red Notebooks), circulating the work of authors such as Raniero Panzieri, Romano Alquati, Mario Tronti, Antonio Negri and Sergio Bologna, first introduced the practice of compositionist analysis into a renewal of communist thought and engagement. Feminist theorists working from a compositionist perspective, such as Maria Rosa Dalla Costa and Silvia Federici, and groups such as Lotta Femminista (Feminist Struggle) radicalised the scope of the method, insisting on the critique of the various relations of reproduction and unwaged work as sites of antagonism (Wright, 2002; Red Notes, 1978; Cunninghame; Bargallo & Federici, 2012). Since the early period of compositionist thought in the 1960s and 1970s, the method has continued to be used as means to problematize the organization of the reproduction of capital.

Compositionist analysis comprises two related categories: technical and political composition. The general category of class composition refers to the technical organisation of (re)production of capitalism and the political forms of organisation that emerge both within and against this arrangement. The concept of technical composition takes on a specific dimension of meaning in this school of thought [2]. On the simplest level, technical composition is an expression of the structural organisation of labour-power in the production process, and the conditions of the reproduction of labour-power. Perhaps put otherwise, technical composition expresses the technological conditions, or lack thereof, that determine the characteristics of the labour process of a given area of work. It is also an engagement with the myriad features of what is required to perform specific tasks 'on the job' in a given area of work. The technical composition of class comes to assume, or at least inform, the posing of a political dimension in so far as the organisation of capitalism involves class antagonism. [3] Finally, technical composition articulates specific forms of the labour processes of respective types of work, placing the development of such processes within the cycles of class struggle.

In recent years, there have been gestures toward a renewed analysis of affective labour through the lens of compositionism. For example, Hardt and Negri revisit the question of the technical composition of class in *Commonwealth* (2009). Hardt and Negri's analysis identifies in the contemporary technical composition of class three trends: firstly the hegemony of immaterial production, secondly the so-called feminisation of labour, and finally the migratory movements of labour. According to Hardt and Negri, the three trends of the 'technical composition of labour...all are engaged in the production of common forms of wealth, such as knowledges, information, images, affects and social relationships, which are subsequently expropriated by capital to generate surplus value' (2009: 139). However, their examination is very general, and says little of consequence for understanding a contemporary technical composition of class, at the micro and daily level. For example, although the three tendencies Hardt and Negri point to do resonate and express in broad terms elements of the configuration of contemporary class composition, they cannot explain the ongoing encounters that mobilise the production of knowledge, affects and so on within the framework of capital's organisation of work. As a result, it is not possible on the limited terms of the 'three tendencies' to grasp the details and microelements of antagonism that occur in the everyday conditions of immaterial production. The perspective offered here by Hardt and Negri does not draw out the complex and dynamic relations that a detailed engagement with the terms of technical and political composition of class can provide. This article moves towards addressing this problem, through a critique of the relationship between affective HCI and labour in the workplace.

The contribution and limitations of the theory of affective labour in the critique of contemporary capitalism

The conceptual terrains upon which the theory of affective labour is developed are wide. Theorists of affective labour draw together Spinozist and Deleuzian concepts of affect and a Marxian critique of capital to interrogate the process of value creation and exploitation in post-Fordist capitalism (see Spinoza, 1996, Deleuze, 1988 & 2005, Negri, 1999, Casarino & Negri, 2008, & Hardt & Negri, 2000, 2004 & 2009). Whilst the specific engagement with the works of philosophers such as Spinoza and Deleuze constitutes a key conceptual field for the development of the theory, feminist critiques of political economy, emotional labour and the body have also been pivotal. [4] Drawing from feminist critiques of emotional labour and 'reproductive' work, autonomist Marxists have developed the theory of affective labour within the broader conception of immaterial production.

The work of theorists such as Michael Hardt (1999), Antonio Negri (1999), and Franco Berardi (2009a), represents one attempt to rethink labour and work in a contemporary context.

For these theorists the condition of post-Fordism is in fundamental ways characterised by the emergence of immaterial production. For Hardt and Negri, immaterial production sees 'images, information, knowledge, affects, codes, and social relationships...coming to outweigh material commodities in the capitalist valorisation process' (2009: 132). [5] The emergence of immaterial production is marked by an increase in the amount of labour carried out in service industries generally. Perhaps more importantly, with immaterial production the work of communication, cultivating relationship and producing affect comes to constitute primary points in the organization of accumulation in contemporary capitalism. In other words, the resources, raw materials and labour used in immaterial production are directly affect, language and knowledge. This is what is meant when it is said that today, fixed capital and the general intellect are increasingly located not in machinery but in the bodies and brains of workers.

In a somewhat different register, emphasizing the pervasiveness of communication to contemporary production Paolo Virno has argued that the 'communication industry...plays the role of *industry of the means of production*', in so far as techniques of communication and relation become means of production in post-Fordism (2004: 61, emphasis in original). The passage to post-Fordism, which brings us to the present conjuncture, complicates the relationship between time and labour, and the techniques that articulate this relationship. Christian Marazzi (2008: 41) brings this complexity to the fore, emphasizing the centrality of language and communicative-relational action in post-Fordist production. Marazzi argues that 'the chain of production has...become a *linguistic chain*, a semantic connection, in which communication, the transmission of information has become both a raw material and instrument of work' (50, emphasis in original). Here, language and communication become the stuff of production and the means of wielding it; production sees the linking of material and execution of labour in language and communication. However, it is also necessary to locate affect and emotion specifically within the post-Fordist economy. Berardi's articulation of semiocapitalism maintains that 'productive life is overloaded with symbols that not only have an operational value, but also an affective, emotional, imperative and dissuasive one' (2009(b): 107). In the passage to post-Fordism, the labour of producing affects, communication, knowledge, the creation and maintenance of relationships and the cultivation of attention emerge as key economic terrains.

On a higher level of abstraction the theory of affective labour produces a number of political and philosophical problems. For Hardt and Negri, affective and immaterial labour do not produce commodities, but rather social relationships and ways of life. In other words, the category of labour merges with that of life, and thus becomes a singular productive substance. Immaterial production and affective labour therefore become biopolitical production: work that produces the very fabric of social life and of the common. The emphasis on biopolitical production marks a key element in the ontological turn in post-

workerist thought. The limitation of the ontological turn in theories of affective labour becomes clear when we return to some of the critical resources provided by earlier examples of compositionist analysis within autonomist Marxist theory.

All of the above authors have, in their own way, attempted to come to terms with the new forms and configurations of labour. In doing so they have identified the various forms of the direct relationship between the body, subjectivity and the labour processes of immaterial production (Eden, 2012). Although some of the primary theorists of immaterial production and affective labour emerged from the perspective of compositionist analysis, the theory's construction has dispensed with some of the key theoretical insights of the earlier period of research and political practice. The key limitation of the analysis of the class composition of immaterial production arguably lies in its flattening, or collapsing, the categories of technical and political composition into the singular foundation of biopolitical production, or productive life. [6] It is in this move, however, that the rigour of the critique of labour and work is lost. The perspective developed in this paper seeks to avoid the problems of this ontological turn through refocusing on the question of the technical composition as expressed in affective HCI.

The complexities that emerge when we consider the technological nexus that is developing specifically within the factories of affect, whether these are call centres, hospitals, retail outlets or any other customer service floor, warrant a more nuanced consideration of contemporary forms of technical composition. The point of departure for such a consideration involves, following the insights of early compositionist critiques of class and work, the technical, including the technological, organization of labour. It is with this point of departure in mind that the analysis of this paper will approach both the question of affect within HCI, and also that of developing the complexity of the theory of affective labour and its composition. Whilst theorists of affective labour have identified the need to consider the problem of immaterial production, they have less to offer in critiquing how the relation of capital and its various technical elements have also taken up and incorporated this same problem of affect and labour. The critique of affective HCI in this paper thus aims to situate affective HCI, specifically OKAO Vision, as an element within the structural organization of labour-power. In doing so, it will be possible to look firstly at the specific implications of the use of this technology at work, and secondly, to develop some general points to be applied to the more broader analysis of affective labour and immaterial production. We will return to the discussion of composition and HCI towards the end of the paper, with an emphasis on the elements of technical composition.

Affect and emotion

On a superficial level it appears that the various theorisations of affect have in common an understanding of affect as a bodily and relational force. Yet in certain disciplines and registers affect and emotion can be used interchangeably. It is therefore useful to be clear about the difference between these categories, particularly as we are attempting to come to terms with the process of modulating and ordering affect through HCI at work. The definitions used throughout this paper will follow those of Gilles Deleuze and Brian Massumi (Deleuze, 1988; Massumi 2002). Following Deleuze, affect is an intensity of feeling that runs across, between and through bodies, but which cannot be captured within an individual body. The sense of relation is thus never closed, and affects cannot belong to a subject but must be a flow of intensity between bodies expressed as passion or action. As Massumi suggests, emotion will necessarily emerge from an affect, but it is effectively objectified and possessed by an individual. Emotion becomes the individual's, the subject's expression of feeling. In this respect, perhaps, emotion represents the reduction of affect as open flow to something that is quantifiable, fixed and exchangeable. It remains to be seen, however, whether various affective HCI technologies necessarily carry out such a reduction, or whether they rather generate a unique process of order.

In *Post-cinematic Affect* (2010) Steven Shaviri makes the argument that affects bear the same relationship to emotion as does labour to labour-power. The first in each of these respective relationships, affect and labour, can be described as the open intensity, and the non-containable force: labour is the form giving fire of human creativity; affect is the open intensity of relation that cannot be individualised and objectified (Marx, 1973, p361; Spinoza, 1996). In contrast, the categories of emotion and labour-power are the objectified form of the creative intensities from which they emerge, and which they represent. Emotion is a contained, personalised moment of affect, while labour-power constitutes the captured, commodified expression of labour (Massumi, 2002; Marx, 1951, pp74-97). Building upon this distinction, we come to the following problems: if the exchange of labour-power is a necessary objectification of labour within the social relation of capital, it might seem difficult to talk of an affective labour within the valorisation process, based on the terms of distinction outlined so far. In a different sense, we also need to clarify the role of HCI technologies, in this case OKAO Vision, in the determination of affective or emotional relations. We will return to these problems throughout the paper.

HCI and the circuits of order and amplification

Recent trajectories in HCI, drawing from work in affective computing, have sought to emphasise the affective state and expression of users in the design of interactive technologies, and to develop the capacities of machines for affective display (see Zeng et al., 2007; Gunes et al., 2004; & Truong, 2010). Rosalind Picard's (2000) work on affective computing opened up a field of enquiry which has subsequently been taken much further by researchers and designers in the field. The variety of innovations emerging from affective computing and HCI is vast and include eye tracking instruments, devices which interpret the emotional significance of physiological data such as temperature and heart rate, as well as emotion and gesture recognition technologies, to name just a few (see Gunes et al., 2004; Lao & Kawade, 2004; Zhao et al., 2003; Jaimes & Sebe, 2006). The diversity of these trajectories all indicate a general 'turn' to affect in computing and interactive technologies.

HCI, understood as a broad field of research and development, focuses on the improvement of the relationship between users and computers. However, the engagement with affect in recent decades has contributed much to expanding this field. Speaking generally, prior to the affective turn, most research in HCI was concerned with the logical and calculative powers of the computer, while studies in human-machine interaction focused upon the adaptability of the user to the computer. [7] Here, it was assumed that it is easier to get a person to adapt to the rigidity of a machine/computer than to get the computer to learn and adapt to the user (Raskin; 2000). More recently, as Noam Tractinsky et al. (2000) have demonstrated, researchers have uncovered empirical correlations between designs that address the affective dimension of an interface and its perceived usability by humans, constituting evidence that challenges the previous wisdom of function over form. The increasingly sophisticated engagements with affect are productively complicating the frameworks through which computer and interface design and development is thought. Not surprisingly, in the relatively short period of time in which affective computing and technologies have emerged as a field worthy of serious consideration (Hudlicka, 2003; Sengers et al, 2002; Boehner et al. 2005; Partala and Surakka, 2004), numerous divergences have emerged. These divergences reflect the difficulties inherent in the very definition of the concept of affect and cognate understandings of interaction.

Some of the initial engagements with affective computing approached the problem of the direct relationship between an individual user and his or her computer. Picard (2000:1) defined affective computing in terms of computing that either relates to, influences or arises from emotions. This implies that the computer should be able to recognise emotion in the user, recognise and respond to this emotion, and in other cases, that the computer

itself possesses emotion of its own. In a paper linking affective computing and HCI, Picard (1999), identified four areas of development: reducing user frustration, communication of user emotion, developing the means to handle affective information, and finally development of social-emotional skills. In each case, the aim is to improve the fluidity of the relationship between an individual user and a computer through a direct attention to the dimension of emotion in computing.

Picard's conceptualization of a one-to-one affective relationship between user and computer reveals a number of practical and theoretical limitations. In the first instance the slippage in terms from affect to emotion opens the way for a conception of affect as a quantifiable substance, which can be measured, interpreted, learnt and directed. Following the argument of Boehner et al. (2005), what we have here is an example of an informational model of emotion. In their words, 'emotion, in the informational model, is a dual of cognition, but it is nonetheless the same sort of phenomenon – an internal, individual and delineable phenomenon, which acts in concert with and in the context of traditional cognitive behaviour' (p59). Thus the potential for opening a deeper affective engagement within the confines of this informational model is limited by this reduction of affect to a quantifiable unit. This, in fact, has reproduced some of the very problems that advocates of affective computing had identified and critiqued in the cognitivist approaches to artificial intelligence. A further limitation can be identified in the personal nature of the relationship between user and computer. The construction of the concept of affect, emotion and relationship here effectively reduces these terms to fixed possessions held either by the user or the computer. The affective relation here is an interchange of fixed units of emotion, determined through the reading of indicators on the body, or in the expression of the computer. Affect itself is defined as a fixed possession, or inherent feature, of a person, precluding any understanding of its social, cultural or political dimensions (Sengers et al., 2002).

To counter this notion of affect as information Boehner et al. (2005) develop an interactional model as a way of constructing a more complex framework through which to approach the question of affect and emotion. Within the interactional model affect is not reduced to either a possession of the individual or a characteristic that can be fixed within a computer. Rather emotion and affect are placed in a social and cultural context, and as such are seen as dynamic arising from action and interaction. Within the interactional model we can see affect as a form of intensity produced in the relationship between the user and computer.

The theoretical openings and limitations produced in affective HCI, such as the informational model, has led others to push the potential of interactive design in the direction of constructing environments or spaces of becoming. Jonas Fritsch (2009) draws on Massumi's crucial theorisations of affect to deepen the prospects for affective engagement in HCI. As

is well known, and pointed out above, Brian Massumi develops the Deleuzian and Spinozist theorisations of affect, through an array of discussions of how a body, already constituted by various intensities and potentials, that is, affects, is in turn affected and thus moves to a higher or lower capacity to act (Massumi, 2002). Affect is a pre-personal potential and intensity, which is irreducible to the level of the personal or individual. Affect is inherent to and mobilised in experience and event, which is to say affects move and reconstitute given bodies. To affect or be affected is thus to be within a process of becoming, to a greater or lesser capacity to act. Fritsch discusses these theorisations of affect in the context of a public interactive installation called *Touched Echo* (Markus Kison). The interaction with the installation creates an open affective engagement through the orientation of the interaction and the transformation of the physical space in which it is installed. What is significant in Fritsch's discussion is the investigation into the installation's production of an amplifying and expansive affective encounter. Fritsch's contribution to the field pushes to a further level the conception of affect within interaction design, beyond models of emotion and information.

Based on the above discussion of tendencies within the development of affective technologies, it is possible to make a qualitative, yet fluid, distinction within the field. On the one side of this demarcation lie those innovations in the application of affective technologies for the amplification of affect, and on the other side lie technologies for the ordering of affect. The demarcation is fluid in so far as the distinction between amplification and ordering could shift depending on where and how a given technology is mobilised and functions within the materiality of social relations. Yet it is useful as it allows us to problematise the relationship between technology and affect, and going further to grapple with the tensions involved in their deployment. Technologies of amplification can be defined as those situations in which the orientation of their use is in the construction of an expansive affective engagement and environment, as discussed above in the works of theorists such as Fritsch (2009) and Boehner et al. (2005) Here we encounter an affective resonance opening out to processes of becoming. On the other hand, ordering technologies function not through resonance and expansion but act as a directive force upon a body's behaviour. It is to examples of these latter technologies that we now turn our attention.

The original online version of this article includes an embedded video: Figure 1: 'Smile Training for Japanese Workers', New Tang Dynasty Television, 2009. Permission to embed by New Tang Dynasty Television.

That video is available at <http://youtu.be/ReC86fy1pJQ> and the original article is published at <http://twentyone.fibreculturejournal.org/fcj-151-the-modulation-and-ordering-of-affect-from-emotion-recognition-technology-to-the-critique-of-class-composition/>

OKAO Vision & assemblages for the ordering and modulation of affect [8]

In its 2009 annual report, the company OMRON provided a brief overview of one of its most recent, cutting edge and 'exciting' sensor technologies. The name of this sensor technology is OKAO Vision, commonly called the smile-scan, and is OMRON's most advanced model of a facial recognition technology. The senior manager of OMRON's sensing and control laboratory, Masato Kawade, has stated that 'the technology has great potential for a whole host of applications from consumer electronics to healthcare. Imagine a camera that makes sure you don't miss that moment when everyone is smiling at their best. Or what about a 'smile-checker' for people working in the service industry?' (cited in *Control Engineering*, 2007). Evidently, the software itself is quite versatile, and as such there are a number of applications for which the facial imaging and sensor technology can be used. In applications designed for the private consumer these include hand held photography cameras, video game applications, and in personal computers for purposes of security such as biometric login. In other instances, facial recognition technologies have been installed in public areas, such as town squares or transport areas with high pedestrian traffic, for identification and surveillance, including the ability to identify individual faces within large crowds. However, of importance for the present discussion is the use of the technology for commercial applications within the workplace. OMRON's OKAO Vision has been installed for use in service and care industries, where it is used for training and on the job monitoring of the worker's facial expression. It is this latter deployment of OKAO Vision as a directive upon the worker's body that I will analyse below.



Figure 2: Screenshot from 'Smile Training for Japanese Workers',
New Tang Dynasty Television, 2009.

Facial recognition technologies function by reading, categorising and responding to a person's face. The basic steps of the operation include fixing an image, reading it and providing a feedback loop with the user. The software first fixes an image then detects the face within the image. The feature points of the face, eyes and mouth, for example, are located within the image. Once the computer has recognised and interpreted the configuration of the feature points of the face, it is in a position to assess the overall image. The process provides the foundation for the facial recognition of the user. The information accumulated from the individual user's face is compared against the OKAO Vision library or database, which in turn informs the feedback to the user, including an estimation of gender and age, as well as facial condition including expression, gaze, and finally a facial image optimisation (Lao & Kawade, 2004).

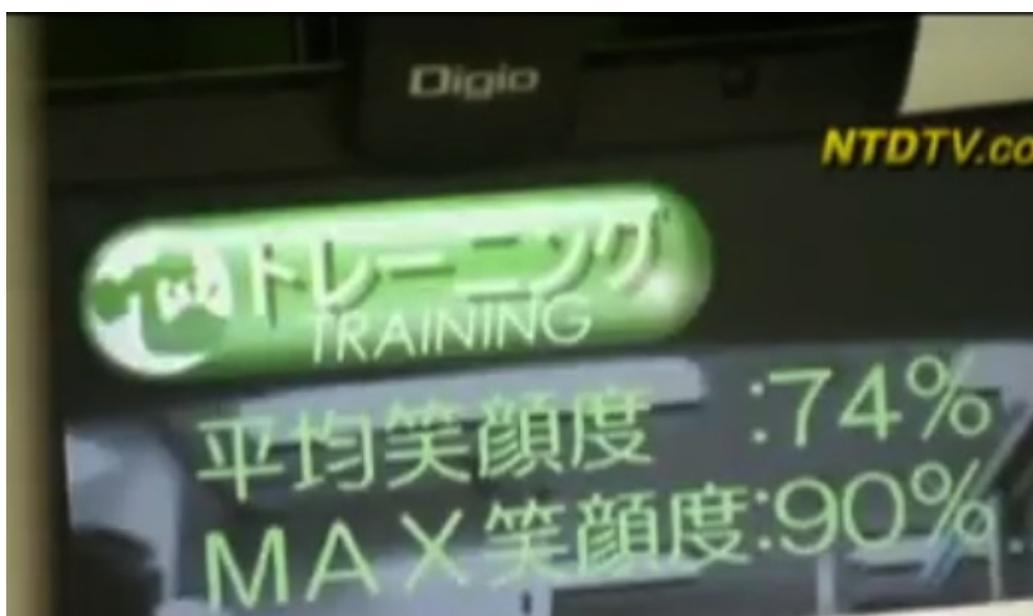


Figure 3: Screenshot from 'Smile Training for Japanese Workers', New Tang Dynasty Television, 2009. Permissions provided by New Tang Dynasty

The smile scan follows much the same series of operations, but adds layers of detail along the way. The scan itself locates a larger number of points on the face, such as the tips of the eyes and mouth, points on the cheeks. Reading the individual's face and the position of their features, the software then constructs a model image, a three dimensional configuration of the face, and compares this against a library of facial images in its database. Given the measurement of the face and the location and shape of the key features, the software is then able to provide a feedback rating and assigning a value measurement of the individual's smile, out of the potential result of one hundred percent. It does this through measuring the movement of the key features of the face as it smiles. The categorisation and response generally involves the assignment of a given value and emotional reading of the individual's face.



Figure 4: Screenshot from 'Smile Training for Japanese Workers', New Tang Dynasty Television, 2009. Permissions provided by New Tang Dynasty Television.

At the time of writing, existing reports show that the OKAO Vision technology has been in use in various service, retail and health workplaces for the purposes of training and monitoring employees whilst at work. At Keihin Station, the smile scan technology is in use for the purposes of regulating the bodily performance of workers at the station and for the purposes of training. In this case, workers at the station undergo a smile scan at the beginning of a shift. The technology, as indicated above provides a measurement and ranking of the 'potential smile' of the individual, a percentage out of one hundred. The point of this process is to develop in the worker the most perfect smile for the individual to perform whilst on shift. It is reported further that they retain a print out of their smile scan to remind them throughout the day (Meyers, 2009). Each of these applications operates as a directive on the body of the worker to perform a repetitious but familiar appearance of intimate labour.

There are in fact two interfaces in the process of production involving OKAO Vision. The first is that determined in the relationship between the user (worker) and the computer (OKAO Vision). On first appearance this relationship functions within a closed circuit. The worker engages with the computer, which interprets, measures and feeds back the information about the performance of the worker. However, given the fact that the use of this circuit is to modulate the performance of the worker in a second environment, which might be put as the shop floor, the closed circuit at a given point opens onto this second space. At this point, the body of the worker, having already been engaged, interpreted, and modulated/compelled by OKAO Vision, becomes itself a second interface expected to produce a desirable affective encounter with those other bodies it comes into contact with whilst at work. In the connection between the time of the worker's first encounter with OKAO Vision, and the

ongoing performance throughout the worker's shift, we witness the broader assemblage that modulates the form of affective labour carried out on the job. This larger procedure, consisting of the first encounter between user-computer and the opening of this circuit onto the second space of the shopfloor, situates OKAO Vision as a central component of the assemblage for the ordering and modulation of affect.

It is useful here to locate OKAO Vision alongside another example of the use of affective technologies for the modulation and ordering of affect in the workplace. In a similar way to the smile-scan, the use of vocal emotion recognition technologies in call centres produces a relationship between user and computer that compels the performance of a specific affective labour. This involves the use of vocal emotion recognition technologies in the training of workers, as well as at the point of interaction. *Diverted to Delhi*, (Stitt, 2003), demonstrates the use of HCI as Indian call centre workers are trained to perform correct communication with clients. The outcomes of the training and monitoring consist in the pronunciation of words, accent training to sound either accent neutral or 'native' to the country from which they are calling and/or receiving calls, and finally training in vocal pitch and tone. As is the case with the use of OKAO Vision, the first circuit between the worker and the technology produces an affective performance, which the worker then repeatedly enacts in the encounter with other bodies when on shift. [9]



Figure 5: Screenshot from 'Smile Training for Japanese Workers', New Tang Dynasty Television, 2009. Permissions provided by New Tang Dynasty Television.

The implementation of OKAO Vision in the workplace functions through the measurement of the performance of an emotive display for the creation of an affective encounter: it

creates the possibility for the indexing of the efficiency of affective performance. The notion of efficiency in service work often takes on new meanings, as it is difficult to subject practices such as care or attention to the usual standards of productivity and metricity. However in a context in which relation, attention and emotion become key considerations of economic organisation, the modulation and intensification of affect is paramount. Upon this foundation, affective technologies are linked to the effectiveness of the worker, and to this degree a conception of efficiency within the workplace. The application of emotion recognition technologies such as facial and vocal emotion recognition is already evident in some service industries involving human-human affective interaction and human-machine affective interaction, or both (see Omron, 2009; Vora, 2010: 33-47; Records et al. 2007).

Returning to problems of composition

Throughout the remainder of the paper we will problematise the theory of affective labour in relation to OKAO Vision and the broader issue of work and technological assemblages for modulating affect. Having considered the terms of class composition, and of HCI and OKAO Vision specifically, I would like briefly to draw these threads together, returning to the problem of composition. It is clear that the development and innovations in affective computing and their application within HCI are now critical elements within computer design. The importance of the turn to affect is evident in the discussion throughout this paper. In the condition of ubiquitous computing, the importance of innovations in affective design of interfaces will only grow. At the same time as this tendency develops, we see that there is a mirrored importance of affective HCI in the dynamics and forms of technical composition of class today. Inasmuch as affective labour is, in many workspaces, mediated by the computer interface, the configuration of affect as a quantifiable substance (or emotion) to be modulated in the interests of securing customer satisfaction and loyalty is enabled by theories of HCI that focus on the instrumental relation between the user and the computer. The smile scan can be understood as an exemplar of this.

In another respect, however, and returning to the conditions of post-Fordism and ubiquitous computing, we again see the importance of coming to terms with the emerging technological infrastructure oriented to organize the production and circulation of affect. Within the framework of immaterial production, the social composition of affective labour goes beyond the technological mediation of the computer to seep into the entire infrastructure of affective relations that constitute the post-Fordist workplace. From this perspective, with or without the direct mediation of such technologies as the 'smile scan', the post-Fordist process of valorisation necessarily attempts to subsume the affective relations of society, and thus is intent on the ordering of affect, and perhaps its

transformation into emotion. The critique of the technological nexus of affect is thus relevant for understanding the composition of affective labour at both the immediate encounter with technology at work and throughout the social terrain.

The attempt to impose a metrics and form of measure onto affective relations generates a refraction of affect from the perspective of the worker. The process of refraction operates through the modulation of the production of relationship imposed by particular affective HCI technologies. The attempt to impose measure, and thus transform affect into something quantifiable, sharpens the relationship between affective labour and perceptions of worker efficiency. Further, the relationship between affective labour and efficiency is evident in the literature and management techniques that are concerned with worker performance of affect and, for example, the interpretation and development of indicators of sales rates of workers linked to affective engagement (Byron, Terranova & Nowicki, 2007; Bjerg & Staunaes, 2011) [10]. Affective management techniques work as elements alongside affective HCI in the workplace as an apparatus of compulsion and refraction. As Bjerg and Staunaes point out, managerial technologies of affect are designed 'to energise the register of affectivity', to 'concentrate on the production and formation of intensity' and that in this framework 'affects and affectivity are not simply by-products or something to be overcome, but the core matter to be managed by and through' (139). Whilst it may be theoretically untenable to subject affect to measure, to reduce it to something quantifiable, the techniques of modulation and measure demonstrate the will to subsume, and to order, that the process of post-Fordist valorisation mobilises. It is through the lens of compositionist analysis of these elements of affective labour that future research and critique will be best placed to understand the forms of tension and antagonism such a condition produces.

Prism, control, refraction

The OKAO Vision smile-scan, and its use in the workplace, functions as a directive upon the body to produce a particular affective performance. This performance in turn can be characterised as a modulation of affect on two levels, occurring simultaneously. Firstly, the scan compels the worker's body to perform affect. In other words, this is a regulation of labour, but not in a linear temporal sense, but rather in compelling the body to produce an affective intensity. The first element of the modulation of affect takes place in the circuit between the worker and the computer. The next element in the modulation of affect takes place in the second space of the shop floor, in the encounter between the worker

and the bodies it engages. In other words, once processed by the smile scan, the workers reproduce a particular form of engagement or relation with those they come into contact with. The labour they perform is certainly involved in the production of communication, relationship and affect. However, the organisation of the material constitution of this work, problematises, rather than confirms, the literature concerning affective labour and affective or emotion recognition technologies.

The applications of the smile-scan technology function as a directive upon the body in a repetitious compulsion to perform affective labour. The process of affective labour is identified and regulated through repetition in the smile scan, in order to reproduce a performance of intimacy. It is through this process that affect and labour become indexed and ordered through the value rating and training organised through the application of OKAO Vision in workplaces. The deployment of OKAO Vision in the context of affective labour produces the homogeneity of a striated space in which work is organised.

Spinoza theorised affect in the interaction between bodies, and the means by which they come to determine other bodies to different states of movement or rest, and express what happens to the modes of substance (Spinoza 1996; Deleuze 1988: 48). The concept of the technological infrastructure as a prism and point of refraction is introduced as a way to engage affect, labour and value whilst retaining the Spinozist foundation of affect and singular substance. In other words, there is no need to pose a restoration of essence of being, or the completely alienated subject to be restored. Rather the tension or antagonism is located through the prism as it compels the body and affect through the technological articulation of labour. This necessary movement through the OKAO Vision technology, as it orders the affect of the worker, constitutes the point of refraction of affect. In this movement, the affects of the worker's body are determined to a different degree of movement, in turn producing a particular affective encounter through the space of work. The worker's body and affects are not removed, but rather engaged, modulated and ordered in the double interface produced by the deployment of OKAO Vision in the workplace. In this respect the imperatives of value's self-valorisation determines the degree of movement, and repetition, to the worker's affective labour.

The use of emotion recognition technologies in job training and at work, thus points towards a novel form of command in the workplace and of the performance of labour. Alongside this, the mobilisation of affect in management discourse and technique, specifically as a mechanism for intensified self-management, demonstrates a further dimension to the integration of analyses of affect, understood broadly, to the command of labour. Emotion recognition technologies and affective management techniques, in this sense, represent an attempt to introduce/impose a form of measure to the production/circulation of affect in

contemporary work arrangements, and thus to link quantifiable standards and notions of efficiency to the command of affective labour.

Conclusion

It is increasingly evident that the turn to affect is a central element in the future of computer design and for HCI technologies. The present innovations within HCI and design demonstrate this tendency. Whether these innovations are developing the informational model of affect and increasing the level of sophistication of these technologies, or whether designers and theorists are pushing beyond this model to radicalise the experience of interaction, it is clear that the engagement with affective design is of key importance. However, whilst the relationship between affect and interface design has been developed and interrogated in various ways, the field has not addressed to a similar degree the implications for how we think about labour and work in relation to affective technologies. And yet, in the post-Fordist condition of the expansion of labour involved in communication, emotion and affect, the tendency for these technologies to confront labour as a directive force or control technique becomes a key area of tension. This paper has sought to contribute to opening this area of research and critique through integrating a discussion of affective HCI with the perspective of compositionist analysis and the modulation and ordering of affect at work.

Developing a compositionist approach allows us to situate affective computing and HCI, in this case OKAO Vision, within a specific relationship produced by the valorisation process and in the workplace. The discussion of OKAO Vision provides a brief insight into the circuits of interaction between user and computer in the workplace, and the process of modulation and order produced in this situation. Rather than a simple interaction between user and computer, in the context of the workplace, affective technologies can function as a directive upon the body of the worker in the first moment of interaction, which in turn produces a homogenous form of interaction between the worker (user) and those bodies it engages on the job. In this respect, the discussion of OKAO Vision, in the context of a compositionist perspective, opens some possible directions for developing this area of critique in understanding the impact of affective computing and HCI on the social and political dimensions of work.

A second and minor element of this paper, again through emphasising the compositionist approach to analysing affective technologies, allowed us to problematise the terms and limitations within the theorisation of affective labour. This task was carried out primarily through the identification of the limitations concerning the understandings of

the technological organisation of affective labour, and pointing to the need for a serious reconsideration of the technical composition of class. These limitations, it was pointed out, arise primarily from the ontological turn of post-workerist elements of autonomist Marxist theory, evident in the collapsing of the categories of life and labour, into a singular productive substance. This ontological turn has meant that these theorists have marginalised the very material, everyday organisation of this labour. However, a return to a compositionist analysis, which picks up on the emerging technological nexus involved in affective and immaterial labour, specifically affective HCI, provides a means to address these limitations.

Biographical Note

Mark Gawne is a PHD student at the University of Sydney, writing a thesis titled *The political and economic dimensions of affect: a critique of post-operaismo perspectives on immaterial production and affective labour*. This work develops a critique of the political impasse produced by the ontological turn of recent post-operaist theory.

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Notes

[1] Throughout this paper I will generally use the term autonomist Marxism to refer to the theoretical literature that has developed the theory of immaterial production, affective labour and compositionist analysis. This term is used for the sake of simplicity, and because in English this is the most common name for what is in reality a heterogeneous constellation of perspectives. Although using the Italian terms of Operaismo and post-Operaismo, naming the earlier and later tendencies of autonomist Marxism would provide more accuracy, for the limits of the present paper, autonomist Marxism is sufficient, and provides greater continuity throughout the paper.

[2] In the opening of chapter 25 of *Capital vol.I*, Marx outlines his conception of the composition of capital. For Marx, these include the value composition of capital, the technical composition of capital, and the relation between these in the organic composition of capital. As is so often the case in Marx, these different categories express the material and a social dimension of capital. The technical composition for Marx is the material expression of capital in the relationship between variable and constant capital, whilst the social composition is expressed in the value composition. These each express, in different ways, the ratio between constant and variable capital, between the means of production and living-labour. The relationships outlined here by Marx, give an indication of the notion of compositionist analysis within the Autonomist thread of Marxism, however the latter perspective adds a twist to Marx's explanation, through a more direct engagement with the subjective elements of class within the framework of composition.

[3] Throughout this paper I am focusing on some nuances that emerge in the question of technical composition, and simply pointing to how an engagement with this element is necessary within the analyses of class composition and affective labour today. Whilst this is a limitation on the scope of the argument and does not provide the workers' perspective, it is in line with the objectives of the paper. For discussions on political composition and its relationship to technical composition, see Sergio Bologna, 'Eight Theses on the Militant Historiography'.

[4] Although feminist scholarship is often cited as a pivotal source in the development of the theory of immaterial production and affective labour, and indeed is in a number of respects, it is important to note the serious criticisms made by feminists of the immaterial production theses. These criticisms charge that the theory of affective labour effectively marginalizes, excludes or ignores the critical insights into the critique of political economy made by feminist scholarship at least since the 1970s. In carrying out such a marginalization, the specific power dynamics and hierarchical divisions in the various forms of 'reproductive' labour are smoothed over in the generality of the theory of affective labour. I am in agreement with these criticisms, although I do not address them explicitly in this paper. See for example, Alessandrini (2012), and Schultz, (2006).

[5] There is significant criticism of the theory of immaterial production, particularly in such claims that it 'outweighs material commodities' (See Henwood, 2003). Hardt and Negri have counter argued that they mean immaterial production outweighs, or is hegemonic, in the sense that it has a qualitative effect upon other areas of production (See *Multitude*, 2004: 109). This particular debate is not relevant to the concerns of the present paper, as here I am not analysing the empirical quantity of service work, or the hegemony of immaterial production, but rather looking at the material organisation of labour within service industries

and the forms in which affect becomes a contested terrain within this work.

[6] Hardt and Negri claim to invert Foucault's conception of biopower to include the perspective of the resistance and the productivity of the multitude. They name the perspective produced by this inversion biopolitical production. Biopolitical production becomes, for Hardt and Negri, the production of the common, of knowledge, affects codes and so on. As such, biopolitical production is a key element in the ontological turn of post-workerist thought. However it is also in the centrality of biopolitical production for the post-Operaisti that the simplification of the technical problems of work takes place. For Hardt and Negri's discussion of their reading of Foucault's biopower, and their presentation of biopolitical production, see Hardt and Negri (2000, 2004 and 2009).

[7] The shift in design focus to engage affect marks a significant break with previous emphases in computational and interaction engineering and design that effectively prioritised function over form. Elizabeth Wilson's recent book *Affect and Artificial Intelligence* (2010) draws attention to the importance of affect in Turing's thinking on artificial intelligence, uncovering an often-neglected history of affect in computing. However it remains the case that despite this minor thread of affect in computing, by and large, until very recently, the power of cognition and calculation has constituted the index against which intelligence is measured.

[8] See New Tang Dynasty (2009) for use of OKAO Vision.

[9] It is not the intention here to argue that the use of affective technologies in the workplace is inherently negative and restrictive. Moreover, the discussion in this paper has avoided engagement with the workers' perception of the use of OKAO Vision in their workplace. Ariel Ducey's *Technologies of caring labour: from objects to affect* provides an insightful discussion of the complexities and nuances of perception concerning the use of various affective technologies in the training of health care workers in the United States. Although Ducey does not look at HCI or indeed any forms of computerized technology, her analysis can be of use to us. Ducey highlights both the limitations of the use of technology in soft skills training, and the problems that the commercial logic within which they are deployed creates. Yet she also points out the potentialities the technological objects may hold for opening and expanding the capacities of workers to affect and be affected whilst carrying out care work, a form of work that 'produces society itself'. The points raised by Ducey are important, because they point beyond the contexts of the use of emotion recognition technologies in call centers and the use of the smile scan. It is clear though that the use of

OKAO Vision in the workplace does not play a role in the production of soft-skills, as is the case in the discussion provided by Ducey, except in so far as being trained to smile could be said to count as a skill.

[10] Bjerg and Staunaes (2011) provide an insightful analysis of the development of affective management techniques and the shift from reflexivity. They develop upon the work of Massumi and Deleuze in developing the critique of how affect as a mobilizing force is being deployed in the management and self-management of individuals and workers. For a broader discussion of the history of affect within the workplace, see Gary Latham, *Work motivation: history, theory, research* (2007).

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FCJ-152 Entertaining the environment: a conversation.

Andrew Goodman.
Monash University, Melbourne.

Erin Manning.
Concordia University, Montréal.



Weather Patterns—Erin Manning, Nathaniel Stern,
Bryan Cera, Andrew Goodman, 2012

Andrew: Erin, before we discuss the implications of 'Entertaining the environment' [1] with an artwork or event, I thought we could perhaps start with a brief outline of how you arrived at the concept?

Erin: I think the concept has been lurking in the sidelines of my practice for some time. It began to take form around questions of interactivity, particularly around technologically innovative art projects that themselves question how art tackles notions of participation. Two issues seemed most salient for me in this turn toward the technological: 1. How do we not become too entranced by the technology itself, bending to its needs—how, as artists, do we not fall prey to feeling as though it is technology that provides the experience. Or, put differently, how do we not fall prey to the idea that it is technology that supplies the wonder, while at the same time not dismissing the complexity of technology and the many roles it can play within our practices? 2. How do we retain a sensitivity to the art- event (not just the technology-event), keeping in mind the difference between interactivity and relation, between the setting up of a cause-effect scenario and the creation of an event.

These questions led me to take the process of investing in digital technologies very carefully, wanting to be certain that I could back out at any moment. My sense is that once the investment in a technological process becomes too dominant, we can lose sight of the field effect we are looking for—an effect that may be available with much more limited use of technology. This is not to speak against the use of technology, but to ask how technology itself becomes artful. How to create a patient investment in "what the art can do" and not just "what the technology can do."

"Entertaining the environment" comes out of this thinking. It is a reminder not to place ourselves too quickly at the center of each experience. It suggests that what is perceptible may not be immediately available to us, or may be obfuscated by our expectation that relation always includes us. And it perhaps pushes us to reconsider how experience unfolds, leading toward more nuanced interpretations of what participation can mean.

"Entertaining the Environment" also places us immediately in a relational framework rather than investing in the hierarchy of subject and object (human and nonhuman). When the human is considered the centre of the experience, the sense is that the entertainment also has to fit into human-scales of time. In an art experience, this usually means that the access to the artwork has to be quite quick—the attention of the spectator must be secured within seconds. But when it's the environment that is being entertained, suddenly there is a different sense of duration. It is not solely about us, but about how the various assemblages—concrete and abstract, human and nonhuman—are realigned through the

artistic process. Concretely, this means that we begin to design, or better to create platforms of relation, for more ephemeral participants—air currents, movement, breath. And in doing so, we are perhaps more aware of how space is crafted, how time itself is artful.



Weather Patterns—Erin Manning, Nathaniel Stern, Bryan Cera, Andrew Goodman, 2012

Andrew: This is going in several interesting directions already ... Perhaps to bring it back to your first statements about technology, there does seem to be a general difficulty in finding a balance where technologies are utilized in art works. So many works seem invested in a demonstration of the technology's capabilities (and/or the artist's technological skills). Likewise in 'interactive' work (a problematic term at best), there is a tendency to demonstrate the interactions/ connections on a very overt level—a doubly deathly combination when interactivity and technology are combined. Somehow both artists and, I think, viewers need to get beyond the entrancement with what the technology is doing and, as you say, back to "what the art can do". If we think of painting, for example, I don't think anyone would accept that the major conversation between a painting and a viewer would be about the pigment or type of medium used, even if the painter or a painter/viewer might

be invested in thinking this through. And in fact when we watch TV or go to a movie, for the most part the huge technological complexities that allow such events to happen are hidden from sight—even CGI imagery needs to do more than demonstrate power nowadays to hold an audience—we want a different kind of engagement. It seems naive for an artist to think that they could supply much wonder through technological demonstration, considering the capabilities of Xboxes/iPads and so on.

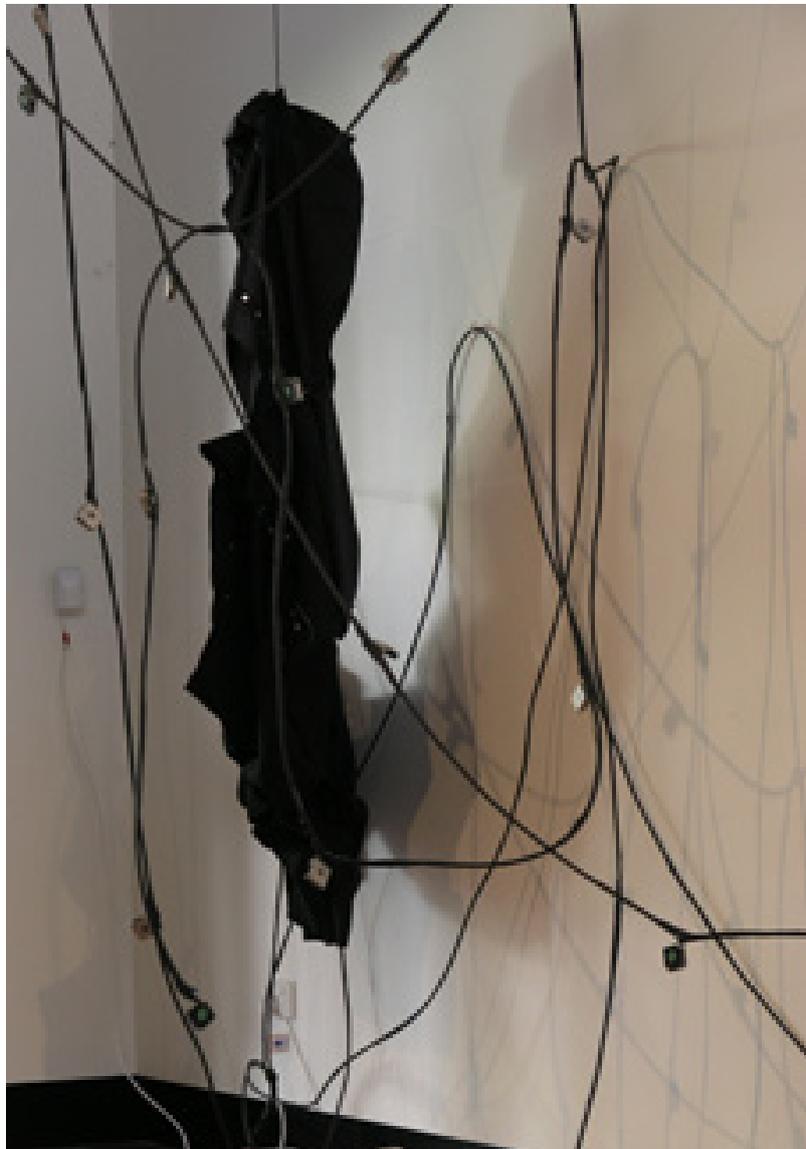
Given all that, your approach of investing cautiously in technology seems a wise tactic. I try to remember the relational works of Lygia Clark as a benchmark of what might be achieved through very simple means. Perhaps we should all plaster our studios with images of her work, along with Dan Graham, Robert Irwin and Steina and Woody Vasulka to remind us of the imaginative possibilities at the fringes of technology. At the same time, electricity, for example, seems to have interesting possibilities in terms of thinking forces outside of any human agency. I'm thinking of the earliest experiments/art events with electricity—running a current through a line of 300 monks holding hands, for example (it's the image of monks holding hands that brings in the poetry). [2] While clearly this has a 'demonstrative' element, it seems to me also involved in a shift in positioning the human in the environment—an understanding of and entrancement with environmental forces capable of transversing and reorganising the human. In this way perhaps technology does open possibilities for thinking art events outside of human-centric fields.

Erin: Andrew, I love this image of the monks—particularly when we think of it less as a human circle than as an electric circle activated through a collective body. Lygia Clark is certainly an example I hold on to, particularly as a reminder that the art object is not ultimately what art is about. The artfulness of art is about the lure it activates, the provocation. A painting is a lure for feeling-seeing texture- become-image or shadow-become-sound (to think of the use of calligraphy in early Chinese painting). Lygia Clark's relational objects were not "valuable" or "artistic" abstracted from what they could do—they were "just" bags, rocks, air. But taken in concert with the relational field they were capable of activating, they became-art, became artful in the sense that they were capable of affecting the environment they were co-creating.

Technologies, as you point out, are ever-present. We cannot conceive of a world without them, nor should we. The point is to activate them at the level of their integration into a lure that stimulates the event, not to make them the event in their own right. It's not that I don't think technology-in-itself can't be an event. It's just that I don't think that is the best use of an artist's talents. Microsoft, NASA, Nike can make technology an event—they have the means to do so, and their teams are poised to produce the newest-new. Art, it seems to me, is best at doing something different: at making apparent the interstices between capitalisms

and their outdoings, at making apparent the interstices between the present and the folds of time that run through it. I think of art as proposing an event-time that is not allied to linear time, that is not about novelty per se, but about creating alternate conditions for a tweaking of experience.

Andrew: I like the fact that we're including painting in this conversation. It seems to me that too often its relational possibilities are overlooked in favour, once again, of mediums more overtly able to demonstrate relation, whereas really any mode of art has potential to include interesting events of relation, as it can also fall into representational traps.



Weather Patterns—Erin Manning, Nathaniel Stern,
Bryan Cera, Andrew Goodman, 2012

What we are talking about here could be defined as the making of 'propositional' artworks—Whitehead's definition of a proposition being of a 'lure towards feeling'. This most obviously links in Western art history to conceptual art, but also whenever events of relation are thought of as the primary artistic 'product', whether between objects (Duchamp's *Three standard stoppages* [1913-1914]), objects and bodies (Clark's *Caminhando* [1963]), or purely the conceptual (Yoko Ono's *Grapefruit* [1964]). I mean that it doesn't exclude the making of objects, but that they are employed tactically rather than representationally, valued for their ability to condition, to seed the actualisation of interesting events. It does seem to me though, that there is perhaps an interesting shift from much of 60s/70s conceptual art to contemporary propositional works such as yours—a shift away from the index and towards a concern with the much more slippery areas of affect and sensation. It relates to conceptual art in that it is concerned with an open-ended 'thinking-through' of concepts through action and is not about representation, but the events produced are less concerned with activating conceptual processes in the viewer/participant, and more with activating Deleuze's 'blocs of sensation' (my favourite definition of art).



Weather Patterns—Erin Manning, Nathaniel Stern, Bryan Cera, Andrew Goodman, 2012

Paul Klee defines art's purpose as making things visible, making us see or experience in a new way, which I think fits in with your statement above about art not being about novelty but rather allowing a 'tweaking of experience'—reconfiguring old or accessing new, and potentially decentered, relations within the world. Perhaps this brings us back to the question of what reconfigurations of relation/experience "Entertaining the environment" might specifically offer? One of the first things that comes to mind for me, suggested by the title of your work in the exhibition—*Weather patterns*—is an interest in reconnecting with or embracing the forces of multiplicities within nature [3]. Michel Serres refers to multiplicities as 'nebulous set(s)...whose exact definition escapes us, and whose local movements are beyond observation' (1995: 103), and he lists heat, flame, clouds, wind, and climate as instances of multiplicities with transformative powers that 'nature makes us live in'. Are connections with these kinds of 'unknowable' fields of relation of interest to you in your work?

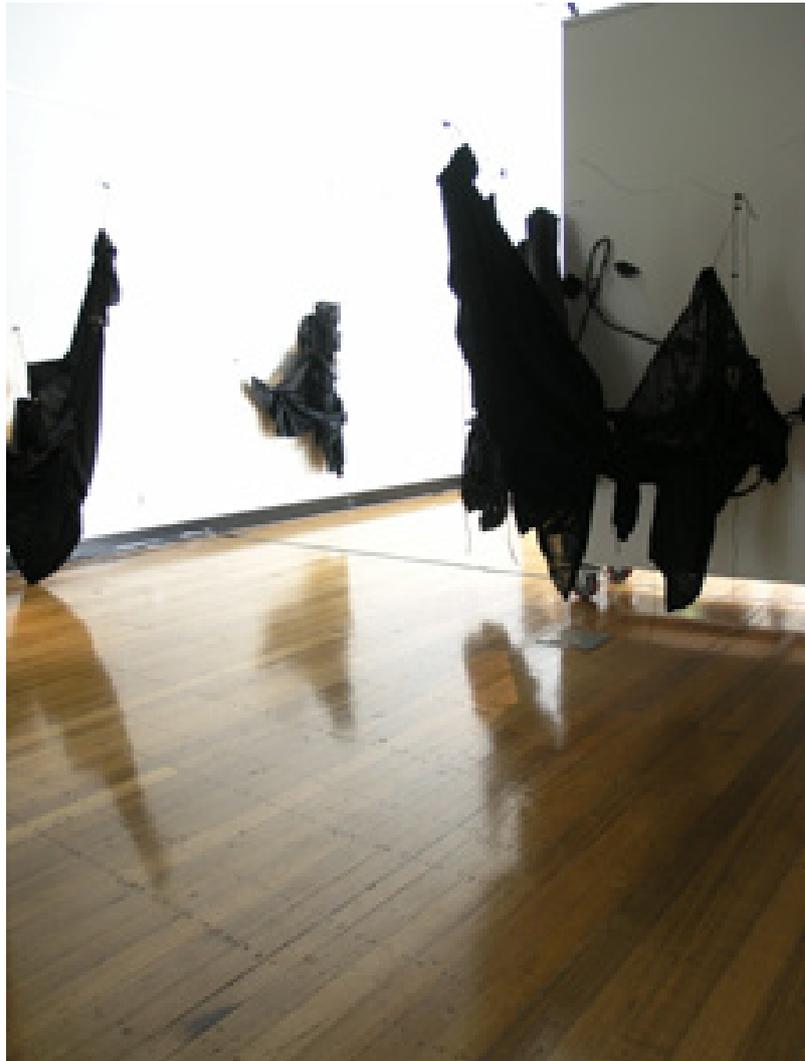
Erin: Absolutely! I am thinking of weather as that which surprises and disrupts, and also that which is absolutely everyday, backgrounded from experience. Whitehead talks of negative prehension, referring to aspects of experience which actively make up experience without being prehended as such. I think that for the most part this describes weather. Though, in countries like Canada (and perhaps, with climate change, more and more countries are going to move in a similar direction), weather is also that which explicitly moulds experience. It is not simply that which is expected, it is that which is overcome (be it the -30 of winter or the +30 of summer). This would also be the case in places that high rates of floods or tornados, or for farmers who depend on weather for the crops. In such cases, weather itself becomes propositional, an activity that not only frames but also creates modes of engagement.)

Weather Patterns as a piece plays on all of this, but with a focus more on the side of negative prehension. I think of it as a weather system in its own right—a sound-and-wind-maker that responds not only to your direct interaction with it, but to the multitudinous electromagnetic variations in its wireless field. The idea of backgrounding human interaction (or at least not foregrounding it) was based to some degree on weather itself, which is very much out of our hands!

The last iteration of the work (May 2012, Millwaukee USA), with Nathaniel Stern and Bryan Cera, complexified the field of interaction by building in a system of digital-analog speakers that move the sound through the fabric-field (a line of 45 speakers was created with sound

bouncing from one to another). We also created a fan-line that is similarly activated by the movements in the field. The data stream itself is activated by sensors sewn into some of the fabric pieces (which also have conductive fabric sewn into them). But the focus for me is not so much on the technical aspects as on the ways in which this system can make felt some of the complexity of weather all the while emphasizing its non-human-centred focus.

With your collaboration for the next iteration (August-November 2012, Melbourne Australia), I see us complexifying the soundscape, which at the moment is very basic. Sound is something you have worked with a lot, perhaps you have ideas about how sound can best work in a work that seeks to make felt field effects? I know your own work has played with these kinds of ideas as well. One of the ideas you mentioned was the possibility of making a (sound) effect that is itself negatively prehended—a sound, perhaps,



Weather Patterns—Erin Manning, Nathaniel Stern, Bryan Cera, Andrew Goodman, 2012

that unfolds in a time that is not of the human. What would a sound be like that took three months to unfold? (I am thinking of the three-month span of our exhibition/collaboration project).

Andrew: So a negatively prehended sound would perhaps have to be conceived as one that one (as a human) could somehow become aware of, in its existence, but unable perhaps to perceive it—one to grasps it conceptually only. If you take the pitch of a sound outside of a perceivable human range—higher or lower—I think there can still be an affectual relation to the body: low sounds experienced as some kind of almost rhythm or pulse in your bones, and high sounds that are almost felt as a sensation on the hairs on your skin—that's at least my approximation, since they escape any direct conceptualisation—you know them only sideways, through their effects. Of course with the high-pitched sounds you 'know' them through the effects seen in the environment—most specifically all the dogs start to howl in my neighbourhood when I'm mixing.

To me this could lead into the idea of 'micro-perceptions', things noticeable through affect and sensation rather than perception, that as a multiplicity perhaps can become a perceived sound. Its something I've been experimenting with, layering eight or more sounds 'behind' the dominant sound so that while you cannot ever name them as separate things, they add qualitatively to the overall effect. That is, when you take them out it sounds different somehow, but the change is nothing quantifiable, almost, I want to say, an affectual tonality, that works through the body in ways other than the ears. Perhaps this relates to synesthesia—we have to start thinking outside 'normative' perception and about what a sound feels like on the skin, what it tastes like, what it looks like, as much as what it sounds like.

But more generally, as you suggest, thinking imaginatively through specifically non human time spans and/or fields of environmental forces that other 'beings' can connect with is an interesting angle, inherently decentering the human. If we accept from Whitehead that all entities are capable of prehension then we will want to specifically think inanimate as well as animate and sentient beings—which is where imagination comes in. What forces in nature is a rock attuned to—heat, wind, acidity? Where do a tree's sympathies lie—with rain, daylight patterns, symbiotic conversations with bacteria? On some level we can I guess imagine these things conceptually if not bodily—we can also know mechanically but never empathically understand what the changes in sap flow as the days lengthen feels like and how this connects a tree to the tilt of the earth.

But what about ways of experiencing that we can't even really begin to imagine or name? In *The embodied mind* Francisco Varela talks about different mechanisms for seeing—humans have, apparently, developed three differential categories (hue, saturation and tone), while some animals have only two, and others have perhaps four or more. These added qualities are not simply extensions of our ways of seeing (being able to see infra red, for example), but completely new categories. For example, he postulates that there might also be, for some creatures, a rhythmic pulse to objects that gives a whole new dimension to 'seeing' (Varela, Thompson and Rosch, 1992: 147-180). Even as we know and can already experience that the senses are synesthetic and already irretrievably intertwined, this seems to go beyond that to truly unknowable forces.

The big question for me is whether we can manage to make something felt that is so outside of human timespan or perception so that it can only be understood negatively. Can this be more than a conceptual understanding? That is, can we move beyond a level of pitching a tone that humans can't hear, while telling them it exists so that they can conceptualise their lack of perception, to a true prehension, related to/in a bodily, affectual or sensual manner? I'm not sure if this will be a productive line of inquiry, whether it could prove enlightening or too negative towards, not only human subjectivities, but also more-than-human bodies rather than establishing new and interesting relations with them ...

Erin: The challenge, as you say, is not presuming to know how a more-than- human ecology makes itself felt not only beyond the human, but also for the human. It would be a relatively straightforward move to create a theoretical problem that translated to one that we call negatively prehended (that is, work with sounds that are outside of human hearing but heard by animals). But this might simply keep us in a standstill as regards experimenting with the idea of entertaining the environment—it might presume we know what that means and can orchestrate it. It seems to me that the call must remain experimental, that entertainment is something that we need to be reinventing all the while. Brian Massumi and I recently went back to Whitehead's two perceptual categories "causal efficacy" and "presentational immediacy" and rethought them in terms of entrainment and entertainment. We did this to try to activate the sense in "causal efficacy" of there being a force that exceeds any straightforward notion of causality. As we understand it, the first phase of perception - what Whitehead calls causal efficacy - involves an immanently relational intertwining of perception with action. It is causal in the sense that it directly activates a field of relation. It entrains. And out of this entrainment follows the possibility of the activation (the self-activation, at the level of the field itself) of a notion of entertainment, or what Whitehead calls "presentational immediacy." Entertainment here is not about the human being entertained by the environment, but about the direct perception of the fielding of experience such that it brings its qualitative resonances to the fore. I think this is what we are talking about in terms of "entertaining the environment." We are not wanting to explore the idea of

an instrumental, human-centred approach that involves “entertaining” the environment. That would just take us back to square one. Instead, we are asking what it might look like, feel like, be like, for entertainment to be given back to us as a field of relation.

Biographical Notes

Andrew Goodman is a visual artist with a focus on participatory practices, sound and technology, and is currently a PhD candidate at Monash University, researching a rethinking of interactivity through process philosophy.

Erin Manning holds a University Research Chair in Relational Art and Philosophy in the Faculty of Fine Arts at Concordia University (Montreal, Canada). She is also the director of the Sense Lab (www.senselab.ca), a laboratory that explores the intersections between art practice and philosophy through the matrix of the sensing body in movement. In her art practice she works between painting, dance, fabric and sculpture (<http://www.erinmovement.com>). Her writing addresses the senses, philosophy and politics, articulating the relation between experience, thought and politics in a transdisciplinary framework moving between dance and new technology, the political and micropolitics of sensation, performance art, and the current convergence of cinema, animation and new media. Publications include *Relationescapes: Movement, Art, Philosophy* (Cambridge, Mass.: MIT Press, 2009), *Politics of Touch: Sense, Movement, Sovereignty* (Minneapolis: Minnesota University Press, 2007) and *Ephemeral Territories: Representing Nation, Home and Identity in Canada* (Minneapolis: Minnesota University Press, 2003). Her new book, *Always More Than One: Individuation's Dance*, will be published by Duke University Press in 2012.

Notes

[1] *Entertaining the Environment* was an exhibition in Melbourne in during 2012. See <<http://www.andrewgoodman.com.au/388/>>. For more on the concept of entertaining the environment, see Manning, 2011. *Weather Patterns* is a work by Erin Manning, Nathaniel Stern, Bryan Cera, Andrew Goodman, exhibited in one iteration as part of *Entertaining the Environment*.

[2] See Elsenaar and Scha, 2002: 19.

[3] For more on *Weather Patterns*, see http://www.erinmovement.com/erin_manning_weatherpatterns_exhibit.swf.

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issue 21 2012: Exploring Affective Interactions

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FCJ-153 Multimedia Mixing and Real-time Collaboration: Interview with Sher Doruff about the development and use of KeyWorx, the Translocal and Polyrhythmic Diagrams.

Sher Doruff.
Amsterdam School for the Arts.

Andrew Murphie.
University of New South Wales.

Andrew Murphie: I am interested in your background, in how you see your own movement through the use of media. Something I find really interesting is your work with the translocal and the collaborative. I'm also interested in why you are thinking about moving this towards a more directly material practice. [1]

(The online version of this article includes the embedded video *Interfacing/Radiotopia/KeyWorx (DEAF03)* which can be accessed at <http://www.v2.nl/events/interfacing-radiotopia-keyworx>. -ed.)

Sher Doruff: Yes! (laughs) Caught in a transitional vacuum! Would you want a little bit of a history? Is that helpful?

Andrew: Yes, that would be fantastic.

Sher: I went to art school from '68 to '72. I was attracted to what was then emerging, which was conceptual art. But I was unhappy with my art department. So I switched to the philosophy department. In my junior year a new faculty was hired in the art department and

they confronted me and said, 'Why do you want to be in the philosophy department writing papers? You can do-what-you're-doing in the art department, and it's just much more fun!'. And it was actually a very silly, but convincing, argument! (laughs). So I thought, 'I'd really rather make things than write papers'. So I transferred back to art.

I was reading Whitehead's *Science in the Modern World* at that time which had a tremendous impact on me. I was nineteen. I'm sure I didn't understand much of what I was reading really. I remember having an elaborate plan for a kinetic sculpture based on Whitehead's theory of duration (laughs), and if I think about it now it was probably very clunky and not-very-well conceived. But I was very excited about it. I worked on the sketches and when I finally finished my plans, I was quite excited about this piece. I figured it would take me two months to build it. When my mentor looked at my plans he said, 'You're done!'. 'What's next?'. And I thought, 'What do you mean, I'm done? I haven't even started making it!'. He said, 'There's no point in making it, because as far as I can tell the work has been in your process of thinking this through, and then you would be spending two months making this thing in which there would be some skills you would learn, but I don't see the point in it.'. And that was completely confrontational. I still don't know if it was good advice, but it was advice that—it's something that has resonated my entire life.

Andrew: And you still want to work with diagrams!

Sher: (Laughs) Yes! It's a frustration. Anyway. When I left art school in '72, leaning towards conceptual art, I had no idea what to do with it! (laughs) So I was in a band for ten years [2].

Andrew: Really? Ten years?

Sher: With the same people. This is where I learned about collaboration. We rehearsed every day we didn't gig. So really, in my twenties, in the seventies, what I learned, and what excited me was that you come together with a group of people and you make something happen, and you figure out how to do that together. So that's my history. Eventually I became a multimedia artist in New York, working mostly with dance and theatre companies. I've been working with computers since '85. It became my tool of choice, and I worked mostly with sound and then with graphics, and then picked up video when the quicktime protocol was launched in the early 90s.



KeyWorx projection from the Cassis Caput/Helmet Head translocal public webcam dance performance (Nora Heilmann/Sher Doruff) 2003. From left clockwise: Amsterdam, Berlin, New York, London. (image provided by Sher Doruff)

Andrew: So you would have been involved with the initial transformations in dance involving multimedia?

Sher: Yes, in the eighties/nineties... it was very experimental and there was a lot of leeway for failure, and I think that in that sense it was very exciting ...

In 1990 my apartment burned down and I travelled for awhile. I got a residency in Paris for a year, ending up in Amsterdam and eventually in residence at STEIM [3] where I met Tom Demeyer [4], who was working with Steina Vasulka [5]. Steina was Visiting Art Director of STEIM at that time, and she was working with Tom on a programme called *Image/ine* [6], and *Image/ine* ... as far as I know, was the first personal PC application in which you could effectively use real-time digital video editing.

Andrew: I've seen *Image/ine*.

Sher: Yes. I think it really was the first. Tom was, in my opinion, a genius programmer, and to have Steina as a collaborator, well, it was magic. Really magic. I'd taken some courses in digital video editing and AVIDs in New York and I learned quite a bit about digital filtering. When I saw Tom coding it in real time on a Mac desktop computer, it was phenomenal to me. It was also so aesthetic because it had many of Steina's ideas in it. So I spent a great deal of time nosing around the computer lab, checking out what they were up to.

Tom eventually asked me to write the technical manual for *Image/ine*. I'd never written a technical manual before and I thought, 'Can I do this?'. I threw myself into the work, and spent months trying to put together an informative guide. I learned so much from that exercise because it entailed discovering and explaining every connection, every interconnective relation of every parameter to every other parameter of the media objects in the application. I went deeply into the interactive possibilities and that was really transformative for me.

So that was my entrance into interactive dynamic media. This is 1996/97. I started using *Imag/ine* and performing with it, and I taught many workshops to performing artists of all kinds. Those workshops were really interesting. I had something like twenty, thirty people, often, in those workshops, trying to teach them real-time interaction with one desktop computer (laughs) ... many of them didn't even use email at that time so the computer environment was somewhat frightening to them. But in those workshops we also always had some media artists, and one or two programmers mixed in with the performing artists. It was an exciting mix because, in fact, the performing artists were more liberated in their conceptual use of the technology than the media artists and technicians who were somewhat stuck behind their computers experimenting with the software itself, with what the software could do, and not looking beyond the code to the relation to, well, whatever was happening in the space itself.

At some point, I think it was 1997, a colleague asked me to come up with a proposal for an online virtual studio environment. I'd been working with *Image/ine*'s real-time capacities so much that I thought, 'What if there was an online site where you have the ability to interconnect media parameters - sound, video, image, text?'. What if it was a collaborative open environment in which all the players see the same dynamic interface and make choices together? A performative situation in which you would continually enact/react to the choices and content of those performing with you. Synchronous interaction. How to enable this activity over the internet in '97 was completely blue sky although easy enough to imagine

as technological protocols progressed. KeyStroke grew out of this original proposal. To have any hope of actualising it, it needed Tom's skills and brilliance at real-time processing.



Jeff Mann, Michelle Teran and Niels Bogaards using KeyWorx site specifically in Banff CA during the HotWiredLiveArt2 workshop in 2001
(Image provided by Sher Doruff)

So, yeah, imagining that some day the internet—as an enabling environment—could be a zone of processing video, images, sound and text in real-time. In the late ninties ... the only other collaborative environment was Resrock, as I recall, and that was only MIDI enabled. Using the MIDI protocol, musicians could send signals back and forth building musical compositions in real time. MIDI was fast enough for broadband, for modem speeds at that time. So we wrote a proposal with the Waag Society for Old and New Media in Amsterdam as our support institution. We received eighty thousand Guilders—that's roughly forty thousand Euros. It was enough to give the project a kick start.

Andrew: So it's still continuing?

Sher: Yeah, it's changed names and direction but yes, it's been KeyWorx since 2003ish. [7]



KeyWorx screen shot sequence from the performance by Michelle Teran in Rotterdam and Isabelle Jenniches in New York. Taken from Connected! LiveArt (Doruff, 2005: 42)

We began in '98. Tom came on board with Just van den Broecke, who had worked with Lucent and Bell Labs on multi-location and multi-user experiments. He was the perfect server-side programmer for this project. We were lucky to find Niels Bogaards, who began as an intern, to work with me on the interface. So it was a very small team originally, working one day a week on a project that was admittedly crazily ambitious. But over time we actually managed to produce something promising. Lodewijk Loos and Eric Redlinger were important contributors. As we progressed, bandwidth improved in parallel. Our progress seemed to follow the technology protocols in such a way that, by 2000, we had a very, very buggy application that worked well enough to excite a small group of dedicated artist practitioners.

[...]

Sher: I had learned to program MAX in 1990 and that encounter with modular interfacing was influential. We wanted the KeyStroke interface to be modular but not as spaghetti-messy. In a collaborative environment, there's no way a MAX patch can be effective when other (multiple) people are simultaneously working with it. It's just too—it's too chaotic and too idiosyncratic.

We wanted to have the same kind of modularity in an interface but much more intuitively rendered. People would need to enter and somehow easily understand what was happening in a given patch.

But also, and this was unique to KeyStroke, parameters of every media object and controller would be transparently open so that, for example, I could change the speed and position parameters of one of your movie clips with the frequency and amplitude of one my sound clips. That sort of activity opened across a full range of devices and objects. So basically you needed to adapt to creative negotiation on every level. It's collaborative like a theatre piece is collaborative yet more so. You could enter this environment and say, 'You're working with visuals, you're working with Quicktime movies, with moving imagery, with still imagery, or perhaps someone enters with sound material'. You might decide together to assign roles and functions, but then you might not. All media and controllers (mouse, camera, joystick, GPS, etc.) were objects in an open field. The thing is, if you have a modular application your 'playing field' emerges from the negotiations of the players and the transformative objects in play.

Andrew: So it's a modular system but you have all these interstices where negotiation can arise. I should say that before we started the interview we were talking about coming out of theatre and arts backgrounds, and how you learn a lot more about collaboration in these areas. You really do have to negotiate with people, and you also have to go somewhere with them, and I guess, finish the work with them. Get some satisfaction, shall we say, of some kind! Even if it results in death! So what you're trying to design ... it's a kind of an open framework. You're designing for potential collaborations rather than for those that are really heavily structured from the beginning.

Sher: Right! It's essentially about conditions—we tried to limit conditions in the application design as much as possible ... the conditions are established by the players and emerge from the play. KeyStroke/KeyWorx provided the tools, the basic components. The conditions of play can be established while playing or before arriving to play. A lot of the people that use the software—I mean, there was never anything normative in who used it and how. Some people couldn't work with the potential chaos of emerging conditions so they tended towards structured improvisations where they would find some way to establish the initial conditions before they would enter the session, and everyone would have certain terms or tasks or goals. Or roles would be distributed between the people who would join. Everything would be pre-set before they would even begin. With others, sometimes you could be playing in a session and someone else would enter who wasn't even invited, because the

server was open. Then all of a sudden you've got somebody new in this field. They might not be aware your conditions or style of negotiation. You might also choose to type text in real-time, and your negotiations could become part of the performance, because you'd be writing to each other and those texts would be 'public'. On the other hand, a lot of the people who became more adept at the programme would usually run an IRC chat on the side. They'd chat about what they wanted to do next, often not as part of the artistic material, of what you might be experiencing as a spectator.

Andrew: Kind of a meta-dialogue.

Sher: Yes. But it was often interesting to me to see that negotiation become part of the piece itself, you know? If that was the artistic choice.

Andrew: There is a kind of ongoing meta-modelisation in that. [8] The thing kind of shifts, as you say, according to the players, and it forms a kind of genetic modelling as it goes, but these models are changing with time—

Sher: Right—

Andrew: And there's layers of that going on, as well. What were people doing? What were some of the results when people were using KeyStroke?

Sher: Well ... there were many things about KeyStroke/KeyWorx that were difficult to adapt to because it was always in Beta, and it was always buggy, and we had terrible difficulties with network protocols and the emergence of firewalls. So the software itself was constantly having to deal with these kinds of issues. Nonetheless, we had a devoted contingent of fearless and patient artists. I'd say maybe, back in the early 00's there were only twenty or thirty—quite a few interested Norwegians such as Amanda Steggel and Per Platou from Motherboard who sponsored the first KeyStroke workshop in 2000. Also Michelle Teran and Jeff Man, Isabelle Jenniches, Arjen Keesmaat, Nancy Mauro Flude, Linda Dement and several others. It was interesting, because many of those first performances were between Australia, Canada, Norway, New York and Amsterdam. So I would say that those were often the points of contact, the nodes, though they always shifted and there were of course performances we would never know about as the app was freely downloadable.

Andrew: What actually happened?

Sher: Well, there's a community in New York called *SHARE*, and they actually became the biggest user group through the supportive efforts of Eric Redlinger, and they're still going strong. I think they were originally based near St. Mark's Place in New York, and every Sunday they would host translocal performances. They used *KeyWorx*, in tandem with *MAX/MSP/Jitter*, *Pd* and other emerging applications.

Andrew: So you became a kind of religion.

Sher: Hmm. I think there were many people ... not a lot of people, actually, to be honest, a handful of people, devoted to this idea of translocal, real-time collaborative performance. One of the things I try to touch on in my thesis is the notion that translocal experience, as an embodied experience, is amplified because your body is ... you have the sensation of ... how can I say this? The effect of intensities of translocal performance when it's indeterminate and you're collectively negotiating and making choices together and you're playing off those choices as a jazz band would or as a dancers might ... the translocal becomes incredibly, intensely physicalised, but your feeling of space is non-locally oriented.

There's almost an imbalance with the "virtual" in a sense. By which I mean the Bergsonian or Deleuzian (virtual), not the virtual simulation that we talk about when we speak of media technologies and networks. You really find yourself intensely in this differential space. I think that this is something that can be found in translocal experience when it is performative and not when it's streaming, so that it's passive. That's another experience, and that's not what I'm referring to. What I'm interested in is collaborative performance as transducer through non-local space. The space becomes ... it's not that it's a non-issue, it's just a completely different issue. You end up collaborating and your co-existence ... well, happens between your monitors essentially, but in the space of your monitors, as well, and in the shared space is this ...

Andrew: Well it kind of is in the monitors, but its kind of not as well, isn't it?

Sher: Exactly. Brian (Massumi) has an essay called 'Strange Horizon' (in Massumi, 2002), and he talks about the biogram, about topologies, and about vision and proprioception, and he suggests, 'Well, maybe even staring into a screen', you have that same biogrammatic experience.

Andrew: And you used this idea in your discussion of collaboration, I think?

Sher: Yes. When I read that I thought, 'I know this experience, and I know this experience through KeyWorx'. Brian talks about the biogram as the lived experience re-emerging from itself. That's what everyone that I talked to who was an avid KeyWorx user says ... people like Michelle Teran. She told me she would be in a session for twelve hours and it would be only at something like the tenth hour that she would have the sense of losing ... of being completely in sync and being in another world.

Andrew: So, people would get into using KeyWorx for the experience itself? And they would do this quite regularly, as a kind of ritual?

Sher: I believe so.

Andrew: That's really interesting. I hadn't thought about that aspect of it.

Sher: Almost every artist said you needed a minimum of three hours in the environment. This is three hours of completely focused attention before you could find the rhythms between each other, because there's also latency, depending on the network, depending on all kinds of network conditions, and also conditions concerning different styles of making between the people involved. There are also conditions relative to the different kinds of media that you're using and processing, and all of these kinds of things matter, before you find a rhythm together. Just as performers also need that kind of time before they find a rhythm together. But translocally it's a bit different because you don't have the sensation of the person (directly). You can't make eye contact. You don't have perceivable body language between you. So you have to find other ways to find that kind of synchronisation. It's incredibly intense and affective, and it requires so much focus that it creates a kind of extreme experience (laughs). I do think people were in it for that. It was a kind of a high. It was for me ... when it wasn't frustrating. I mean, there was a down side to it as well, because the technology was never plug and play. You could never count on it not crashing—

Andrew: Maybe that's part of it.

Sher: You had to build the idiosyncratic temperament of the network and the application

technology itself into your rhythms and into your modes of play.

Andrew: So when you write about 'polyrhythmic diagrams', [9] is this what you mean?

Sher: By polyrhythms I just mean ... I'm probably extrapolating a little bit from Bergson in that I'm attaching a rhythm to duration, which I don't think he does, but I find that interesting because I'm very attracted to his idea of multiplicities of duration. What I find in performance is that within those multiplicities, the durations of performers, the durations of the 'things' that you're engaged with ... there is an infinite bandwidth of multiplicity, of the durations of everything involved in a particular experience. I think in performance it's quite easy to associate a rhythm with those durations, and in these kinds of performances, if you have rhythms of, let's say, the media components, the rhythms of the processing and the thought of the performers and the people who are controlling those processes ... they're all differently relating. There are these moments where they're polyrhythmic in the sense of very complex and complementary rhythms that sometimes sync, you know, and sometimes come together, and you can never really ... you can feel them all at the same time. You can't hear them all, because you have to fixate on one or the other. Polyrhythms in Western African music are really fantastically complex and you can sort of let yourself go and experience the whole, but when you try to listen to them it's almost impossible to hear them all at the same time. At least, I have that experience. And that's what I felt happen in these kinds of ... it reminded me of Sengalese ...

Andrew: Drumming?

Sher: Yes—drumming. But I'm romanticising it! (laughs)

Andrew: I like romanticising it. As I said, I think the 'not working' and the Beta and everything is really part of it. I really do.

Sher: (laughing) I think if some of the people who used it over the years were here and were listening, they would say, 'Oh, yeah, well, that's Sher just going off and riffing.' But taking the best parts of it ... this is what it was for me, and I spent a lot of time watching people and experiencing what other people were doing. I was so fascinated to observe what happened, and how people interacted with this environment, and for me, that kept me going for six, seven years!

Andrew: Really? So, KeyStroke became KeyWorx at a certain point—

Sher: Yes.

Andrew: But that's not terribly significant in—

Sher: No. We had to change the name because eventually somebody had—well, you can imagine it was quite a common name. So, only for legal reasons. And it did become open source, but eventually Waag Society just couldn't support it anymore. Well, they wanted to roll it back and then work on open sourcing it, which they've done, which is great. But at the same time, they weren't interested in supporting it as an artist's tool anymore. So now, it is a monolithic open source platform mainly utilised by Waag Society programmers for internal projects. I'm happy that it's open sourced, but I don't anticipate artists using it any longer—

Andrew: Really?

Sher: There's no graphic interface. The initial interface that I designed was very quirky, and I still am quite fond of it, but the code quickly outgrew that design. As we kept adding



KeyWorx workshop at Waag Society.
(image provided by Sher Doruff)

modules the screen real estate just became too limited. We had to rethink this and we never had an adequate secondary interface so that people could also easily access a histogram of activity in a readable way. But I still think that one of the most interesting things about the interface was its openness to intervention—to soft or brutal addition and deletion. I mean, it was possible to delete or alter the modules of other performer/players, because the interface was openly shared and any device or object entering the interface was shared.

Andrew: So there wasn't just the power of veto over your own work, it was veto over other people's work ... (laughs) This is free cooperation extended plus! (Spehr, 2003)

Sher: Yes. And often, when people were learning it during workshops, you'd see that happening all the time as they were focusing on understanding the operations ... 'Well, if I do this ...' and then someone changes your connecting patch before your eyes ... the tendency was to think 'I don't want this!' And they'd just delete it!

Andrew: I'd be terrified! (laughs) Again, it's like the theatre, really, in a way. Those kinds of negotiations that we were talking about before: in a theatre, you see it all the time. The actors are, in essence, deleting each other's work all the time, because they kind of have to...

Sher: Overriding ...

Andrew: In a sense, all that—the Beta states, things not quite working, the deletions, and the negotiation of all their theatre and dance and those sorts of ... any kind of collaborative (work) involves similar things.

Do you think something else is coming along now that's going to do—

Sher: You know, I still haven't seen it. If you look at *MAX/MSP/Jitter*, or *PD*— and I feel more of an affinity to *PD* because I would want to support the open source initiative — but they're still not shared interfaces.

Andrew: No. That's right.

Sher: These are the technologies that are used in most current translocal performance. You're sharing data just by sending data over various network protocols, but you don't have that shared dynamic Umwelt.

Andrew: If it's not a completely shared interface, that's a huge difference.

Sher: Exactly. And that's the thing that I still haven't seen. Maybe it does exist, I just don't know about it.

Andrew: You know that phrase that Mark Amerika uses?... He writes about the 'asynchronous real-time' ... [10] which is a phrase that keeps coming back to me all the time while we talk.



KeyWorx screen shot sequence from the performance by Arjen Keesmaat in Rotterdam and Daniel Vatsky in New York. Taken from Connected! LiveArt (Doruff, 2005: 40)

Sher: In fact, I think what we mean by “real-time”—because I always question what we mean by “real-time” ...

Andrew: Because in fact the polyrhythmic diagram you’re talking about is not quite real-time. It’s the durational formation of a diagram that’s constantly modulating in asynchronous real-time—so it is real-time, and it’s not, which I think is maybe one reason why you get these “highs” working with it. The nature of the duration is really changing, in that environment, quite profoundly. I mean you’ll never get a high from one moment, there’s always going to be (a duration of time). That’s interesting.

Sher: Yes, and it was interesting to see with different people how long—there was actually, you talk about linear time, there were different stretches of linear time to achieve that. Michelle saying twelve hours, most other people saying three, but still, it’s ... It’s a long time.

Andrew: We were talking last night about the need for patience, and it’s true. I think if you don’t have patience, there’s little that happens. It’s not just about being “open”. You also need patience, and you need things to go wrong for a while.

Sher: But the shared interface, I think it’s crucial. It’s critical, but it’s difficult. It’s really difficult. And it might be utopian in a kind of way. Dystopian in another...

Andrew: It’s confronting as well, because people’s spaces now are their interfaces. That’s *their* space, as well.

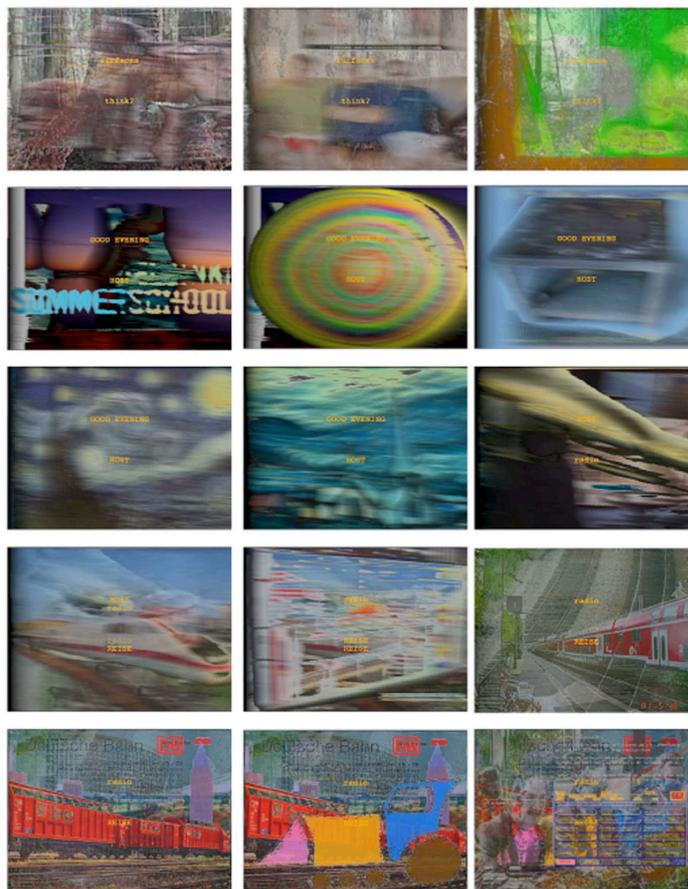
Sher: But on the other hand, we flash forward now, (because I’ve been blah-blahing about all of this ... four years ago). I’m really locked into a 2003 era. In 2006 we now have the notorious Web 2.0, we have all of these social networking spaces, spaces of shared activity—which I’m really dubious about.

Andrew: I was going to ask what you thought about that.

Sher: In fact, I’m just not interested! And I’m not sure why that is, because I’ve spent

so much time thinking about it, and working from these near-utopian visions back in the nineties —“Oh, wouldn't this be exciting!”—to the reality of making, and being involved in the development of such an application, and the highs and lows of all that, and seeing what's possible and what's not possible. What's interesting and what's not interesting. And now, in western culture where social networking has become so influential ... “influential” is maybe not the right term ... I find myself... I'm not interested in these environments at all.

Maybe it's just because of my particular history. I overdosed, maybe, on the social ...



KeyWorx screen shot sequence from the performance by Lodewijk Loos in Rotterdam and Eric Redlinge in New York. Taken from Connected! LiveArt (Doruff, 2005: 38)

Andrew: You were talking about this before the interview, about your feeling of wanting to move back to materials, and you're not quite sure whether that's because you've been too involved in technology, whether you've overdosed on technology, in a way. I'm quite

interested in where it's leading you.

Sher: I'm not sure I entirely understand it myself, but I feel it very strongly. I don't know. Maybe it's the realisation of having been behind a computer screen for over twenty years, and having so much of my life revolve around bits and bytes, in an immaterial sort of way. Maybe it's just a natural process. Perhaps I'm merely entering a continuum that says, 'Now I need tactility. I want to work with materials again because there's been a dearth of it'. I mean—yeah, I don't see myself becoming a Luddite or something like that. It's difficult to talk about now, because I haven't really ... I'm at the beginning of something, and I also don't want to push it ...

Andrew: Yes. I don't want to push you too far on it.

Sher: ... into a rationale.

Andrew: Let me ask you another way! (laughter) With KeyWorx, it sounds almost like it reached its own kind of 'self-enjoyment' or 'satisfaction' at a certain point ... [11]

Sher: Yes.

Andrew: In a collaborative sense, actually, there was a larger social event, a larger "occasion of experience", whatever you want to call it. There was this actual entity there, a 'KeyWorx experience', right? But it perhaps reached a point and that was it, it was there and it was actualised, then, after ... in some ways it seems to be ... not gone for everyone, but people are picking up on that in different ways. I guess, to think more positively, in terms of what you're thinking of moving to now, what are the kind of 'prehensions' being drawn from the KeyWorx experience? The things that are coming out of that that are leading you towards the more material approach? It's not like you're rejecting the technology. It's like, OK, that experience has finished, but what's coming out of that experience that's bringing you back to materials? Again, I don't want to push you, because I know this is an initial period, and you don't know what it is...

Sher: These are my questions as well. I've always been interested in process, and product, for me, has always been a by-product of process.

Andrew: Yet something else takes off.

Sher: Something else takes off. And I've come to accept that that's how I make work, that's what I do, and it's not about these final, finished assemblages that can be aestheticised in some sort of way. There's something about an emergent aesthetic that is very ephemeral, that I've always been after, and what touches me and what excites me. And I think I've been involved in processual aesthetics with digital media now for however many years, and I'm interested to see what kind of format that takes when I'm using other kinds of materials other than bits and bytes. And it may be complementary—I may be using digital media with the material. I just don't know. These things I have yet to find out. But what I'm pretty sure of is that the idea, my attraction to processual aesthetics is my bottom line.

Andrew: OK. And so—it's not just processual though, is it. You want to set up kind of complex forms of collaboration and negotiation, from which interesting things are going to emerge.

Sher: Yes. But I'm also open to the fact that maybe there will be some kind of artefact now! (laughs) So I'm also wondering what that might be. How I work with processual aesthetics, how that might have matured into something that might in fact become artefact.

Andrew: This all sounds very different to where institutions pre-territorialise the whole thing, in a way, so it's already determined. Pre-territorialisation just kills it right from the beginning. I think that's a very common schema coming up. There's that great book by Jean-Pierre Dupuy where he talks about the 'mechanisation of the mind' (2000). He's knows cognitive science very well. Yet he almost doesn't really believe in "cognition", as far as I can tell. He thinks the cyberneticists were wrong, but he says at least they were interesting and complex! Whereas he writes that cognitive psychology, when it came out, it really just got rid of all the complexity and the possibility of emergence, and it threw away the polyrhythmic diagrams and non-linearity and just went for a linear, simplistic version of things. He says it killed everything. Everything becomes pre-packaged, pre-territorialised, which is what a lot of bureaucrats like.

... I'd like to hear more about your actual work in the mid-nineties. You've referred to this as being another story.

Sher: Well, it depends on when in the mid-nineties. In the early nineties I was still working

mainly with sound composition and what was then called multimedia.

I found that, around '95/'96 *Image/Ine* (real-time interaction) was what I needed. I had run into a wall with sound composition, because I had locked myself into a genre I wasn't comfortable with, and I wasn't finding openings for myself. When I had the possibility to watch this new interactive platform in its inception, and follow it on a day-by-day basis, I found it quite exciting that there was an openness and an interconnectivity between parameters of any kind of media—well, that wasn't quite true, necessarily. In the beginning it was mainly video processing, I had always admired the Vasulkas and admired Steina's work, so it was interesting to work with a new application that I could use as well. It was an exciting time, and yes, it's hard to relive, because now we're so used to these capabilities that we don't give it another thought, but back in the mid-nineties real-time filtering and real-time processing without a stultifying latency was just so fucking amazing!

Andrew: I know what you mean. I just discovered it in 2006, of course, but ... I'm about ten years behind.

Sher: (laughs) And I'd worked in the theatre with slide projectors and with 16 mm film and overhead projectors in New York. Suddenly, you know, access to digital technology expanded possibilities within theatre and dance contexts. All live performative contexts. At that time I was not necessarily interested in authoring my own work, but found collaborating with the directors and choreographers more to my taste.

Andrew: OK. This is something I hadn't understood.

Sher: In Amsterdam, for example, in the late nineties, I was sometimes commissioned by composers or ensembles to create visuals for their performances ... sometimes utilising interactive techniques.

Andrew: There's a real friction, you've said, between the experience of the collaboration—

Sher: The experience of the collaborators and the experience of the audience?

Andrew: Yes.

Sher: This is something quite important to keep in mind, because everything that I was talking about in positive and glowing terms about the experience of the event was from the perspective of the interrelation between the performers. It's quite a different experience for an audience, and I think that remains problematic, because the shared intensity between the performers is strategically focused and concentrated. The audience experience is often very different. But this is another major topic ...

Postscript

Andrew: So, looking back on this conversation, which took place in 2006, where have things gone for you? Have you created some artefacts? Or did translocal technologies keep their interest for you?

Sher: Looking back on this conversation I'm surprised by the unabashed enthusiasm of my offhand remarks. It must have been the lovely sunny day, good company and very strong cup of coffee that fueled my exuberance in the re-telling of the good ole days of the dawn of interactive digital media. It's strangely unnerving, in a good way, to be reflecting on this conversation today. Were we to meet over coffee tomorrow the conversation would no doubt be animated with a quizzical critique of the medium that once seemed poised, from my perspective, to evoke a paradigmatic shift in the arts.

It's not as though I view this 'genre' as failed, it just did not sustain my interest. Perhaps its pioneering relevance exhausted itself for me. Clearly, the advent of what is now pervasive streaming media, Skyping, and social networking has subsumed the translocal experience into an indistinguishable mix of synchronous and a-synchronous communication. That once magic flutter of passing through potential itself escapes me now when online.

The coming of the Web 2.0 revolution which was briefly alluded to here in '06 indeed effects my everyday life. I no longer struggle with bugs and crashes in daily doses but then I no longer experiment with alpha and beta hardware and software applications. I rarely if ever use social networks.

Is this the worn old script of the suspicious senior who now tires of keeping pace with the new and romanticises the frontier past? I hope not although I do think the 80-s-00's were a rarefied coming of age of digital arts. I have a persistent sense that the digital lost the fight to de-instrumentalise. It now effects just about every medium as a tool but has, arguably, dissipated its affectivity as a material.

You ask Andrew if I have created artefacts since we spoke. I would have to say, no, not really. I have spent some years researching diagrammatic praxis which continues to insist on de-territorialising incipient form. There is an affective tonality of the *KeyStroke/KeyWorx* experience still at play I suppose. This is perhaps at the heart of my activities now as I mainly teach, tutor and supervise artists in Artistic Research programmes. What I can say regarding the resonance of the 20+ year involvement in interactive media is that I can only approach academic guidance collaboratively and from a beginner's mind. All those years of linking and unlinking the dynamic parameters of things/objects/concepts affects the way I encounter theory/practice relations with students. It's a learned attunement with the fluctuating intensities of the non-relation of relation, as Brian Massumi might say, that somehow describes the reciprocity of discovery I feel with students. So the field of play has shifted, but the collaborative sensibility is as strong as ever.

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Biographical Notes

Sher Doruff currently tutors, mentors and supervises masters and PhD students in in artistic research programmes at the Royal Academy of Art/Royal Conservatory, The Hague, the University of Amsterdam and the Amsterdam Master of Choreography at the Amsterdam School for the Arts. She is a senior researcher at the Gerrit Rietveld Academy. Her doctoral research mapped collaborative, creative processes in Live Art performance practice and is now focused on Diagrammatic Praxis. She is a member of the editorial boards of *Inflexions Journal of Research Creation*, *FibreCulture Journal*, and *RTRSRCH* and has published numerous texts in academic and artistic contexts. Parallel to teaching she attempts to maintain an artistic practice.

Andrew Murphie is Editor of the Fibreculture Journal (digital media + networks + transdisciplinary critique), and Associate Professor in the School of the Arts and Media at UNSW. Andrew's research examines the productive nature of differential intensity. He works on transformation, crisis and possibility—as these are filtered through generative process in media, arts and philosophy, dynamic modeling of all types, and new forms of cooperation in politics/social organization. He is currently writing a book—Differential Media, Differential Life: the past and future of social organization—that rethinks the 'world as medium'. Andrew's work also draws on electronic arts and design (eg cross signal processing), poststructuralism (Deleuze), process philosophy (Whitehead), 'speculative pragmatics' (Massumi/Manning), and extended and dynamicist theories of mind. He also works on the new publishing (academic publishing to books, music, journalism), and related events in education and knowledge mobilization and exchange (technics, methods, and new network, information and attentional literacies). [<http://www.andrewmurphie.org/>]

Notes

1. This interview took place in 2006, in Montréal, during the workshop *Dancing the Virtual* at Senselab. Many thanks to Erin Manning and Senselab. It was edited, updated and extended in 2012. Thanks to Liz Brownlee and Xavier Fijac for help with the transcription. The interview was funded by the Australian Research Council as part of an ARC Discovery grant concerning "dynamic media", on which Murphie worked in partnership with Anna Munster, Adrian Mackenzie, Brian Massumi, Mat Wall-Smith and others.

2. Although, as discussed, Doruff was in an underground band in Chicago in the 1970s, Care of the Cow. See <<http://careofthecow.wordpress.com/>>.

3. For STEIM, see <<http://steim.org/>>.

4. Tom Demeyer is now Head of Technology and of the Future Internet Lab at the Waag Society in Amsterdam. See <<http://www.youtube.com/watch?v=T5k4Kval-Qc>>. Here Demeyer compares 'data with clay. It is something which a programmer can get creative with'.

5. On Steina and Woody Vasulka, see <<http://www.vasulka.org/>>, with a biography of Steina

at <http://www.vasulka.org/Steina/Steina_bio.html>.

6. On the development of *Image/ine* see <<http://timeline.1904.cc/tiki-index.php?page=Image/ine>> and Steina Vasulka discussing her perspective at <<http://vimeo.com/41196405>>. The *Image/ine* site is at <<http://image-ine.org/index.html>>.

7. KeyStroke became KeyWorx in 2003, 'due to trademark issues' (<http://www.keyworx.org/>). It was developed by Waag Society, Amsterdam (<http://waag.org/en/search/node/keyworx>). For more on KeyWorx see Doruff, 2005. See also the Sensing Presence page, at the Waag Society, where Doruff, 2005, among other publications, can be downloaded <<http://spresearch.waag.org/papers.html>>.

8. On metamodelisation, see Genosko and Murphie, 2008; Watson, 2008; Wall-Smith, 2008.

9. On the translocal and polyrhythmic diagrams, see Doruff, 2006a and 2006b. There is more material on her 'Diagrammatic Praxis' site at <<http://www.researchcatalogue.net/view/?weave=6622>>.

10. 'By asynchronous realtime I am referring to what at times feels like a perpetual jet-lag consciousness or timeless time, a blur motion of experiential metadata that indicates a formal investigation of complex event processing where the VJ artist, always gyrating at a pivotal location in the narrative, becomes a multitude of flux identities nomadically circulating within the net-worked space of flows (both geophysical networks and cyberspace networks). Living in asynchronous realtime often produces a feeling of being both avant-garde (ahead of one's time) and time-delayed or even preempted' (Amerika, 2009: 26).

11. 'Self-enjoyment' and 'satisfaction' are Whitehead's terms, for the very process of life, drawing things together into an 'actual occasion'. Crucially, once this occasion has reached a 'satisfaction', it is finished, though becomes available for further 'prehensions' into new 'actual occasions' or 'occasions of experience'. In this there a—

. . . certain immediate individuality, which is a complex process of appropriating into a unity of existence the many data presented as relevant by the physical processes of nature. Life implies the absolute, individual self-enjoyment arising out of this process of appropriation. I have, in my recent writings, used the prehension to express this

process of appropriation. Also I have termed each individual act of immediate self-enjoyment an occasion of experience. I hold that these unities of existence, these occasions of experience, are the really real things which in their collective unity compose the evolving universe, ever plunging into creative advance. (Whitehead, 1938: 150-151)

On Whitehead and technical interaction, see Murphie, 2005.

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