

Process and (Mixed) Reality: A Process Philosophy for Interaction in Mixed Reality Environments

Timothy Barker

iCinema Centre for Interactive Cinema, The University of New South Wales

ABSTRACT

Mixed Reality (MR) environments deployed in the service of art present a radical shift in aesthetics. These relatively recent artistic experiments open up many questions relating to the traditional distinction between subjects and objects. I seek to grapple with these questions of reception by viewing works by pioneering artists such as Jeffrey Shaw, Dennis Del Favero, Ulrike Gabriel and the artist group Blast Theory. Rather than viewing interaction within the reductive logic of a psychologized subject that apprehends a static object – that is the case in so much aesthetic theory – I seek to position the aesthetic encounter with MR environments as a hybrid process. In this paper, by using A. N. Whitehead's process philosophy, I propose interaction as the coming together of two conditions; the condition of the machine and what I term the condition of 'userness'.

Keywords: Process Philosophy; Mixed Reality; Media Art; Interactivity

Index Terms: J.5 [Computer Applications]: Arts and Humanities --- Fine Arts; H.5.1 [Multimedia information Systems]: Artificial, Augmented and Virtual Realities

1 INTRODUCTION

In this paper I use A. N. Whitehead to begin to think about interaction with Mixed Reality (MR) systems through a process philosophy. In particular I view the MR systems that are deployed in the service of interactive media art and enlist Whitehead to propose a temporal aesthetic theory of interaction. I use Whitehead because it is precisely the temporal character of reality that dominates his process philosophy; this allows me to move away from a traditional reception theory and toward a theory that emphasizes the mutual acts that constitute the digital encounter. In Whitehead there are not things made but things in the making. It is the process of entities, not their materiality, that constitutes their existence.

This type of thinking is particularly apt to digital aesthetics. As Andreas Broeckmann points out, the unstable image of the digital is articulated to process. The digital image, whether static or in motion, is the result of continuous and ongoing computations [1]. The digital image itself is an unstable stream of code, never attaining an eternal material existence without the constant flux of information over time. Whitehead's process philosophy is particularly suited to elucidate these non-visual processes that give the digital event its character. In the digital encounter, as for Whitehead's view of the entire universe, there only exist things in the making, which are the direct outcome of a flux of events.

These events are experienced within interaction with MR environments as interconnections are formed between multiple contemporaneous entities, including the coded regime of the digital and the physical and affective regime of the user.

The interactive encounter of media art that takes place in MR environments is essentially performative; the work of art is brought into being through the processes of interaction, the process by which the user physically does something in order to activate the work. In this sense the aesthetics of interactive media art always involve becoming rather than being; in short, they always involve process. Thus, when we think about the performative nature of both interaction and technology, the distinction between the way in which something is performed and the way in which something is aesthetically comprehended cannot be maintained. Whitehead allows me to propose that, because the interactive event enfolds both understanding and performing, the knowledge gained from this interaction cannot be separated from the performative action that provided the condition for this knowledge to emerge. Here process and experience are implicated in one another [2].

Of course, certain process based approaches to art have been developed previously. A temporal aesthetic, focused on notions of performance and process, developed via the installation art, performance art and expanded cinema paradigms of the 70s, largely directed by the systems theory of Jack Burnham [3]. Here the creative activities of the artist, and the relationships formed between objects, were important, not the objects themselves. However, the difference between Burnham's theory, the relational aesthetic developed later by Nicholas Bourriaud, and this paper is that for Burnham and Bourriaud, the experience, and the understanding of these relationships, centre upon ideas of a subject or a knower that apprehends a welter of sense data and relationships from outside [4]. The difference is that the object, although dematerialized, remains a conceptual entity to be known by a subject. For instance The temporal aesthetics that the installation paradigms of the 70s established were based on the viewer moving around inside the artwork, inspecting it on their own terms. The act of moving inside the work, of being part of the work, and forming a relationship with the work was the way in which the object's 'arthood' was performed. Although there is an emphasis on performance here, there still remains emphasis upon the subject's experience, as a psychologized and self-bounded entity, within the work. This emphasis on art as a process is seen in many other art forms, not simply installation art. For instance, Op Art requires a viewer to move in front of the painting to activate its optical effects, Kinetic Art requires a viewer to turn-on a mechanism that causes the work to move, and, much earlier, Robert Barker's Panoramas of the late eighteenth century required a viewer to inhabit the space of the artwork [5]. In short, previous process approaches in art have privileged the subject, her psychology, her relationship to an object, whether this be a conceptual or physical object and, importantly, what she does to perform the artwork. The emphasis thus remains upon the activities that the user initiates in relation to the static object. This paper, in contrast, investigates occasions that arise from both the user and the artwork. At the crux of the argument is a theory that understands aesthetic events not as a subject that apprehends an

t.barker@unsw.edu.au
iCinema Centre for Interactive Cinema Research
University of New South Wales
PO Box 259, Paddington, NSW, 2021

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object, but as user generated and machine generated occasions that *prehend* one another.

In the coming argument I will introduce Whitehead's process philosophy and the way that it can be brought to bear on the interactive event, focusing particularly on his concept of actual entities. Whitehead's work has enjoyed a recent resurgence particular regarding contemporary media and cultural theory. Whiteheadian theory has been used by cultural theorists such as Isabelle Stengers, Steven Shaviro, Andrew Barry, Mike Michael, Andrew Murphie and Michael Halewood [6]. Generally speaking, Whitehead has been used by these thinkers to cast a new light on the debates surrounding materiality, subjectivity and objectivity. For instance, Michael uses Whitehead to investigate the day to day experience of contemporary life as the meaningful connections, or nexus, formed between technology, nature and humans [7]. Similarly Halewood, directed by Bruno Latour's earlier adaptations of Whitehead's philosophy, uses Whitehead to propose new models with which to think about relationships between subjects and objects [8]. I add to this conversation by using Whitehead to propose the encounter with MR environments outside of the reductive logic of the subject/object. Instead, Whitehead allows me to view interaction as a hybrid occasion, as a process of what Gilbert Simondon describes as, and Adrian Mackenzie adapts, *transduction* [9], a process in which the human is supplemented by technology and linked to the digital.

1.1 Case Studies

We will see the Whiteheadian event illustrated in the examples of MR applications that I cite throughout this paper. These include Jeffrey Shaw's *Web of Life* (2002) and *ConFIGURING the Cave* (1996). In each of these works the participant's actions, sensed in material time, are transposed into digital information and affect the aesthetics of the MR space. *ConFIGURING the Cave* utilizes CAVE technology, a stereographic mixed reality environment [10]. The participant enters the CAVE in which digitally generated images are projected onto three walls and the floor along with accompanying audio. In the middle of the room stands a life size artist's mannequin. Manipulating the poses of this mannequin alters the digitally generated images and sounds. Similarly, in *Web of Life* digitally generated stereographic images are altered by the process of a user scanning their palm lines into the system. The difference between this and *ConFIGURING the Cave* is that this work uses several distributed installation sites, linked via the internet. This means that the stereographic images are not just produced and affected by one set of users in one location, but by various groups of user in multiple locations.

I also investigate Ulrike Gabriel's *Breath* (1992-1993). In this work a participant alters the oscillation of digitally generated polygons upon a large projection screen via her breathing. Although this work does not take place in a three-dimensional environment like Shaw's work, it does use a combination of physical and digital information and processes to generate a particular aesthetic. I view this work as MR in the sense that it uses the physical movements of a user in concert with the work's software in order to manifest a digital aesthetic. The aesthetic qualities of the environment emerge from a commingling of physical and digital processes. In this work the movements of the user's diaphragm are sensed by a belt that she wears, and this information is used to set the digital projection in motion and alter the audio reproduced around them. The polygons appear to be breathing and morphing along with the user's actual breathing; the more regular the breathing the more chaotic and violent the movement upon the screen. In this work we can clearly see the supplement of the digital to the human condition. The technology is added to the human body and controlled by the user's physiology.

In addition I investigate Dennis Del Favero's *Pentimento* (2002). In this work, which is a great deal more narratively driven than the previous works, a participant enters a MR space in which the system, via a laser detection system, senses her movements and uses this information to generate blocks of filmic narrative upon the installation walls. In this work the user, in a sense, is indirectly responsible for generating a narrative; their movements, both conscious and non-conscious call up segments of narrative from the work's database. The narrative that is eventually constructed tells of the traumatic events and the aftermath of a murder in Australia's Blue Mountains. However, due to the nature of the erratic narrative movements and constantly shifting perspective, the narrative never reaches closure; rather it remains as disjointed segments of a story.

I also investigate Blast Theory's work *Can You See Me Now?* (2001). This work, as different from those already mentioned, takes place in the form of a game played both in the physical setting of the city streets of Sheffield and over the internet in a virtual city. In this work up to twenty online 'players' can play at one time. Their navigation of a virtual city occurs simultaneously to the Blast Theory performers' navigation of a physical city. In essence the Blast Theory performers play a game of catch with the online players that spans both the real and virtual city. The Blast Theory performers are tracked by satellite and appear along with the online 'player' in the virtual city. Each performer carries with them a hand held computer connected to a GPS tracker which transmits their location through a wireless network to the online players. This computer also shows the performers the online player's position in the virtual city. Here the online player's actions are transposed into the physical world of the city while at the same time the physical actions of the Blast Theory performer are transposed into the virtual city. Thus, in this work the digital and the physical space overlay one another.

Whilst this simple game is played out many more complex and conceptual consequences emerge. For instance, is it possible to establish relationships across these two 'spaces'? If the already mentioned works are about the user's movements being transposed into the digital and used to initiate aesthetic or narrative occasions then this work is about the supplement of technology causing the participants to behave in certain ways. In other words, the technology of the wireless network and the internet reveals itself to both significantly empower and restrict the performative ability of the human participants.

2 DISCUSSION

For Whitehead, reality is not a constellation of stable *things* but one of *processes*. Importantly this means that we cannot think of a user as a self-contained substance at a particular point in space. This is because, as Whitehead states, it is not stable things but the fundamental forces and fluctuating activities that constitute reality [11]. Whitehead states, "If we are to look for substances anywhere, I should find it in events which are in some sense the ultimate substance of nature." [12] We can transplant this thought to the digital encounter and we see that it is not a user and a machine that constitutes this encounter. Rather interaction, at its core, is an experience realized through process.

Importantly this includes things like the digital system's transmission of code into actual images. We can clearly see here that it is the process of the flux of code that generates the existence of the multi-modal forms of the interface. Without process these forms would not exist. Taken further, we can see that, in any interaction with the digital system of the MR environments mentioned above, it is the movement of the participant and the detection of this by the system that initiate the software processes that provide the condition for digitally generated forms to emerge. To take this even further, we see that

the participant's movements are initiated by other processes, such as cognition, affect, muscle contractions and other physicalities. Further still, these processes are initiated by smaller atomic occasions. When we trace this back to the smallest level of occasions we arrive at what Whitehead terms an actual entity.

For Whitehead things or substances are abstractions, they are examples of what he terms 'misplaced concreteness' [13]. Concreteness can only be found in process. Matter is merely the lowest nest in the nesting of occasions of process [14]. As Whitehead points out, when we think of substances, we merely think of the limit point of a series of occasions that extend over one another; we merely think of the outcome of processes. For Whitehead every material thing that we encounter in our daily lives is an outcome of process and events. Thus, digital aesthetics and the affects of these are merely the limit point of the multiple occasions that are nested within the digital encounter.

Process is fundamental. As Heraclitus famously put forward, the river is not an *object*, but an ever-changing flow; the sun is not a *thing*, but an ever-changing fire. Everything in nature is a matter of process, of activity, of change [15]. Following this, the idea of an unchanging subject or object is completely abandoned [16]. As Whitehead states, "the ancient doctrine that 'no one crosses the same river twice' is extended. No thinker thinks twice; and, to put the matter more generally, no subject experiences twice." [17] This is because the subject and the thinker, and their experience, are remade at every instant of duration. Thus a theory of media art within this framework does not account for particular media objects, individualized users, or outcomes of interaction but instead privileges the processes that constitute the objects of media. Media art is not a 'thing', but an ever-changing process. This is particularly evident in MR applications as the work's existence and the 'user's' experience are constituted by a process in which the user and the machine affect one another.

For example, in a work such as Jeffrey Shaw's *The Web of Life* multiple installation sites, one permanently installed at the ZKM, Karlsruhe and four other satellite installations, are connected via the internet [18]. As already mentioned, visitors to the installation scan the lines of their palms into the system and this information affects the aesthetics of the stereoscopic MR environment. In this work the digitally generated aesthetics of the installation space are not just affected by one user in one location. Rather the space is affected by the multiple conditions of various users operating in the work's distributed sites. The information and the aesthetics that are conjured at one instant of interaction are then built upon over time as different users scan their palm lines into the system. The aesthetics of the space are thus built up over time from several networked spaces as the machine absorbs user initiated activities. The work of art here is not a stable 'thing' that is open to aesthetic contemplations. Rather the work is a process of both digital and physical events. The system senses processes that are performed in the physical, specifically the occasion of a hand pressed against a scanner. The system then enacts various software processes in order to generate images based upon this information.

We can also see this process operating in Blast Theory's *Can You See Me Now?* This work again utilizes distributed aesthetics as participants in multiple locations are linked to the work via the internet. In this MR system the Blast Theory performers are also linked to the distributed 'players' via their hand held computers and the wireless network. Here we see an ecology taking form between digital media and humans. The real life actions of the performers on the street are transduced into actions performed in the 'virtual' city. Also, actions performed by the online players are transduced into the real world as the Blast Theory performers move in reaction to the movements of online players. The ecology that is the MR environment of *Can You See Me Now?* is thus

produced by process; it emerges from the occasions that take place as digital and physical occasions work through one another. Once again, this work, as with Shaw's *Web of Life*, takes into itself both physical and digital occasions; the *event* is thus hybrid as the contemporary occasions of the digital and physical work through one another. It is this term *event* – and Whitehead's understanding of it – that is important to my position on digital aesthetics.

2.1 What is an Event?

The short answer to the above question is that, for Whitehead, everything is an event. As Steven Shaviro states in his commentary on Whitehead, "the world...is made of events, and nothing but events: happenings rather than things, verbs rather than nouns, processes rather than substances." [19] For Whitehead, everything in reality, including those things that have the appearance of continuity through time, are made up of a multiplicity of events. All the world is thus in a constant state of becoming as all the world is constituted by the remaking of actual entities at every instant in time. An event is not something that happens *to* someone but rather something that happens *with* or *in* them [20]. We can use this mode of thought when thinking about the aesthetics of interactive media. The event of the digital encounter is not something that happens *to* someone. Rather this event is an event in which the user and the machine are mutually invested, both setting conditions on one another and limiting one another's operation. The digital encounter is thus an event that happens *with* and *in* both the user and the machine.

For instance in a work such as Ulrike Gabriel's *Breath* we can see that the interactive work depends upon the connection of user occasions and machine occasions, both of which work through each other. In *Breath* we can think of this system as a type of 'biocybernetic' adaptation; the system's functionality and appearance is altered based on the real-time measurement of the user's physiology, in this case her breathing [21]. Breathing controls the oscillation of computer generated polygons. But also, in some sense the computer generated polygons control the user's breathing, as she regulates her physiology in order to attempt to control the system.

As Anna Munster points out this work is about asking participants to conjure digital environments by turning their bodies into performative tools [22]. User initiated activities are sensed by the machine as information is registered by sensors on the belt that the user wears. The user's body does not operate as the point of origin through which the digital images are generated. Rather the work is 'embodied' as a relationship is formed between the user's bodily capacities and the limitations of the technical interface and the operation of the software. This is a coming together of the occasions initiated by a user and the occasions initiated by a machine, a relationship that emerges from the event that takes place within the MR environment.

We can also see this type of embodiment in a work such as *Can You See Me Now?* In this work the performers' physical movements through the city streets are put into relation with the technology of the hand held computer, the wireless network, the GPS, the internet and the various online players' computers. The performers' movements around the city are informed by the information that they register from the technology. For instance the hand held computer tells them where to move in order to catch the online player. However, they are also restricted by this technology. They are unable to move outside of the wireless network without losing contact with the virtual city. They are localized or territorialized, in the Deleuzian sense, by the technology. Once again, a relationship is formed between the user's bodily capacities and the technology. The performer's body is supplemented by technology. Through this supplement the interaction of online players are embodied by the Blast Theory

performers on the city streets and the physical movements of the performers are transduced into digital occasions sensed by the online players.

This 'embodiment' – that occurs as the user or performer's physicality is put in relation to the operations and limitations of the technology – is an example of the extension of occasions over one another. Contemporary occasions extend over one another both restricting and enabling each other. The software extends over the user who in turn extends over the software [23].

We can see this in the MR artworks already mentioned; in these environments the work is conjured as digital occasions and physical occasions work together. For example, in Del Favero's *Pentimento* the narrative of the work is conjured as the digital system senses the real time movements of a participant. The system then triggers particular blocks of narrative that may cause the participant to initiate other physical movements, either out of habit, affect, or cognition. In this sense the narrative of the work, which re-tells traumatic events of incest and murder, is not solely immanent to the machine, but is rather immanent in the relationship formed between the participant *and* the machine.

2.2 The 'user' as a set of occasions

In terms of the digital encounter in MR environments we can understand the fact of interaction as the outcome of the interpenetration of the machinic system of the digital and the human system of the user. The digital encounter is a commingling of two conditions or occasions; the condition of the machine and what I have termed the condition of 'userness'. The term condition of 'userness' describes the user-initiated activities that are sensed within the digital encounter; this is a way for me to view interaction as a hybrid process of occasions, rather than through the reductive logic of the subject/object.

It is because of the necessary connections formed through the process of an event that Whitehead does not talk about a 'subject' per se. A 'subject' connotes a permanent or enduring substance, a knower who contemplates the flux of nature from outside. For Whitehead this idea is flawed, the only type of 'subject' that exists is the 'subject' at one instant, as an actual entity, or more correctly if we are thinking of a human as a 'subject', as a society of actual entities. This one moment is tied to the flux of nature by the fact that the 'subject' herself is an event made up of a multiplicity of momentary actual occasions. Any notion of a 'subject', or for that matter a user – as the 'subject' position appears in so much literature on digital media – is thus always tied to the process of events. This is because, just like every other occasion in Whitehead's universe, the 'subject' or the user is remade at each instant. The subject or the user is always 'becoming' based on her relationship with the process of the world.

For example the condition of 'userness' within Shaw's *Configuring the Cave* refers to the process of various user-initiated manipulations of the mannequin. Similarly in Del Favero's *Pentimento* the condition of 'userness' refers to the bodily movements that are made in response to the aesthetics of the environment. These processes are not merely movements that are directed by a self-contained subject who is deliberately responding to an object. Rather these actions are made in concert with the system; they are processes that are emergent within the event of interaction; they are the embodiment of the relationship formed between the technology and the human body.

The condition of 'userness' is a unity of actual occasions; its becoming is based on a collective of users, or a collection of processes, that make up the event of the work. The condition of 'userness' is not one individual user on one individual computer but rather a condition of becoming that is put in process as the work is passed from one user to another.

We can see this operating in Gabriel's already mentioned work *Breath*. In this work the system absorbs the activity of the user. The system, via the sensor belt detects the physical movement of a user's diaphragm and uses this information to initiate the digital processes of image generation. This is the event which gives rise to the condition of 'userness'. As the next user enters into interaction with the system they see that the system still absorbs the activity of the previous user, who has now physically left the installation. Here we can see an example of a continual process of becoming based upon the nexus formed between user-events. As the user enters the installation the digital image is still slowly "breathing" as it is still sensing the latent trace of the previous user. One event generated from a relationship formed between the user and one individual user thus overlaps another event, initiated by the relationship to another user. The condition of 'userness' is constituted by just this extension of occasions. The condition of 'userness', in terms of interactivity, is constituted not by one individual user, but by a society of occasions, which form a nexus through the machine.

We can also see this type of ingression of multiple user occasions in Shaw's *Web of Life*. In this work the aesthetics of the space are not just conjured by one user in one location, rather the space is generated as multiple user-generated occasions are sensed over time from distributed locations. In Shaw's work, as with *Breath*, the artwork is conjured as the information from multiple users overlap. The condition of 'userness' here is not one user in one installation site; rather it is a condition of multiple occasions that transpire in multiple locations. The work is thus made up of processes that occur over time and are distributed in space.

There is an important distinction between the 'user' and the condition of 'userness' and this distinction goes to the heart of my argument. The difference is that a user brings to mind conceptions of a self contained, deliberate and conscious subject that enters into interaction with either another user or a machinic system. This once again bifurcates experience into knower/known relationships. The condition of 'userness' instead focuses on the processes of interaction that occur between the machine and the occasion of a user. Here we do not think of a user as an end point to interaction, as an entity that initiates and directs the events of interaction. Rather, I am attempting to put forward a picture of the condition of 'userness' as a set of processes that occur in the interactive encounter, initiated not solely by a self sufficient individualized user but rather in concert with the overarching character of the digital encounter. Here the condition of 'userness' is represented by a set of actions or processes that emerge over time and in concert with the occasions of the machine.

The idea of experience as a subject cognitively apprehending an object is innately flawed [24]. For Whitehead this bifurcation of nature into knower/known relationships is to be avoided as it wrongly places the consciousness as constitutive of experience. Instead I focus on interaction and the relationship formed between the condition of 'userness' and the condition of the digital. This allows me to view interaction as a relationship produced as the extension of a collection of occasions.

The heart of my argument is that the consciousness is not constitutive of experience, it is rather the other way around, process – and the experience that emerges from this process – prompts the consciousness into being. For Whitehead consciousness is not essential for experience. Rather consciousness is merely one level of experience and in fact is spurred into existence by experience. As David Griffin points out in his commentary on Whitehead, consciousness comes into existence only when it is prompted by the right kind of datum [25]. Griffin states, "consciousness is not lying in waiting, but must be *provoked into existence*" [26]. In order to avoid the bifurcation of nature into knower/known relationships, I, along

with Whitehead and Isabel Stengers, view consciousness as an outcome of the non-conscious experience that every entity in nature endures [27]. The way we come to know is a product of our investment in the mutuality of the experiencing world. Following this thinking, the way in which a particular MR environment presents its information, and the way in which technology supplements human occasions, prompts a certain consciousness into being.

The performative activities that take place in the MR environment, activities that involve an interactive relationship between the human and the digital, therefore necessarily generate a certain way of thinking. In this paper I have not focussed on any discussion of consciousness or the psychology of a viewer. This is simply because it is beside the point of a Whiteheadian framework to consider it as a determining entity. The processes of systems, organisational structures, affects and the relationality of entities are important, not consciousness per se, which is merely an outcome of these processes. In other words, it is the process of occasions that is important; mentality or consciousness is just an outcome of these processes.

I am thus not interested in the reception of images; rather I focus my attention on the process of the hybrid interactive event. In a similar vein, Mackenzie stresses that any contemplation of the way in which we operate with the digital must not only consider the material events and the images of the interface but must also consider the machine's particular software processes [28]. This is because any contemplation of digital aesthetics must also take into account the processes of the digital and the performative nature of interaction. As I explained earlier, performative actions cannot be separated from the knowledge that emerges from these actions. Thus, we are not so much interested in the reception of images by a conscious user, but rather the process of the digital encounter in which many user, hardware and software occasions are implicated [29].

2.3 Aesthetics of Interaction

MR environments such as those mentioned here represent a significant shift in the way we think about art, particularly regarding its reception. Firstly, interaction is temporal. Thus, one is involved in a temporal connection with the changing object of aesthetic contemplation. The user responds to various occasions as the occasions also respond to the user. Thus interaction is an experience of temporal connection rather than an event in which a human spectator encounters a static image. Secondly, as is the case with the traditional model of installation art, the user enters the space of the artwork. For instance in *ConFIGURING the Cave* the user enters into the multi-modal environment of the CAVE, in *Breath* they enter a dark room and put on a sensor belt, in *Pentimento* the user enters into an octagonal room in which a voice rather unnervingly tells you that "this is your room" and in Blast Theory's *Can You See Me Now?* the environment of the overlaid virtual and physical city is brought about due to the relationships formed between physical actions and actions performed over the internet. In each example the user's actions in material time are used by the machinic system in order to conjure the particular MR environment. This is an example in which the technology acts as a supplement to the human body. The human enters into a becoming based on her relationship to the digital; in essence the human body is *transduced* by the digital.

Using the term transduced, as Mackenzie uses it, informed by Whitehead, signifies a *process* of relationships between technology and the human body. In this relationship the human body is transduced as technology both restricts it and enables it to operate in specific ways. I have described this process previously in terms of Blast Theory's work *Can You See Me Now?* This process involves more than just strapping on sensors or

manipulating interfaces, although it involves this too; the process involves the deconstructive logic of the supplement [30]. Here, the supplement that is thought to be merely added to the processes of the physical body, actually reveals this action to be irreversible. Extrapolating from Mackenzie, the supplement of the digital turns out to be inextricably presupposed in the condition of 'userness'. The condition of 'userness' becomes directed by the rules and limitations of the digital, whether this be interaction via a mobile phone network, the internet or any other model of interaction. The users must work within these limitations; they must remain in the networked area, or work within the software's rules, which restrict the processes that they are able to initiate.

Through her association with both the interface and the digital occasions that generate the MR space, the user enters the object of contemplation, being connected to the time of the machine, and becoming connected to the other actants involved in the event of interaction; this is the afore mentioned nexus formed between contemporary actual occasions.

For example, in Del Favero's *Pentimento* the user becomes articulated to a large database of narrative information as well as the affective and relational consequences of this information. In this work, as I have already mentioned, the user enters a dark octagonal installation space. Images are projected upon four walls that represent the events surrounding a murder in the Blue Mountains. The work presents these events as fragments of narrative that are triggered by a motion detection system sensing the presence of a user in the room. As the user moves through the installation space she activates different levels of narrative. The experience of the work is largely constituted by the feeling of not being able to make sense of the events, but somehow still being able to experience their emotional intensity. The user becomes invested in the narrative as she is responsible for generating the uncontrolled, disconnected, but highly affective images from the machine's database.

In this work Del Favero does not aim to create secondary trauma for the viewer but rather to "...open up the lived experience of trauma in its temporal and spatial dimensions." [31] The work is not a *representation* of trauma but is rather a *process* that sets the conditions for trauma to be felt. Here the work brings the user into contact with the digital medium and also its traumatic content. Trauma is felt as the user experiences the discontinuous and turbulent temporal dimensions of the narrative. Thus the performative action of interaction with *Pentimento* sets the conditions from which the knowledge of this experience emerges.

2.4 A unison of immediate becoming

Whitehead describes the performative nature of our awareness by giving the example of the sense-data of a chair. He states that when we become aware of the contemporary chair object we are involved in an interaction of occasions between the chair occasion and our own experience. Whitehead states,

We see the contemporary chair but we see it *with* our eyes; and we touch the contemporary chair, but we touch it *with* our hands (Whitehead's emphasis). Thus colors objectify the chair in one way, and objectify the eyes in another, as elements in the experience of the subject. Also touch objectifies the chair in one way, and objectifies the hands in another, as elements in the experience of the subject [32].

From this we see that the objectification of the chair is the outcome of a nexus formed between contemporary actual occasions, those being the occasion of the chair, the occasion of the eyes and the occasion of the hands. As Whitehead states, contemporary actual entities, such as the chair and the percipient,

or in our case, the multiple actants of the digital encounter, are involved in a "unison of immediate becoming." [33] This means that the immediate present of one actual occasion, in our case the occasion of a user, is also contained with the immediate present of another occasion, in our case the occasion of the machine, which includes software processes, visualisation processes and the transmission of information sensed via the interface. Within this hybrid event every occasion conditions the way the other becomes.

The events of the digital encounter are manifest as a relation between the human and the digital rather than a response that is centered on the human. At this point, interaction manifests as the user interacts with both the content and the form of multi-modal environments; the human comes into contact with both the aesthetics of the machine but also the digital processes that provide the conditions for the aesthetics to emerge [34]. Human processes thus form a relationship with digital processes.

For example, in *conFIGURING the Cave* the technology that senses the physical manipulations of the mannequin is an extension of the user's personal space and bodily actions. The user controls the aesthetics of the MR environment through the relationship formed between their physical processes and the machine's software processes. In this example the work is embodied as the user and the digital share the same space and are implicated in the same event. In another example, in *Can You See Me Now?* the technology becomes an extension of the Blast Theory performers' bodies. As they rely on their hand held computers, wireless networks and GPS trackers the technology becomes similar to a prosthesis; the technology both enables and restricts the actions of the performers. This technology also becomes a surrogate for the online players. The technology represents the online players to the Blast Theory performers as though they were physically present. In this instance the technology is a natural extension of the users' and performers' body as in one instance it acts as a prosthesis or add-on to the body and in the other it is a stand-in for the body. In this work we can see that the technology and the human are brought together as the real world space of the city streets is overlaid by technology. Thus the events that take place in either regime are put in relation with one another. The technology here supplements the real world.

3 CONCLUSION

In the works discussed here, technology is no longer a tool with which the user connects to a specific reality or "nature", the technology is now itself the reality or "nature" that the user inhabits [35]. The space of the digital encounter is not a pre-existing field that sets the conditions for aesthetic events to emerge. Rather, space *is* the emergent. Space is that which is made actual by the interrelationships that are manifest by the virtualities of the interactive event. The artwork is no longer an object to be apprehended by a 'subject', rather the artwork is an event in which the object and subject are both invested. Significant new media art is no longer concerned with the historical drive for artists to represent something of reality. Rather, the digital artworks that I have investigated are involved in a process of creating a specific type of reality. Roy Ascott states that this type of art is the agency of becoming, "...a constructive, more than expressive or decorative, process." [36] The digital encounter, at its most powerful, can be thought of as a constructive process. Rather than seeking a representation of reality in its aesthetic, significant new media forms, such as those mentioned here, create new conceptions of the condition of contemporaneity and new spaces for this condition to unfold.

The digital encounter within MR environments can only be thought of as an event; a concept which moves beyond ideas of

the aesthetic experience constituted by a disinterested subject apprehending a static object. The aesthetics of digital media are manifest by process; a process in which the multiple occasions of the machine, the environment and the occasions of a user work together [37]. This does not merely involve a user consciously responding to the computer's data. Rather the user receives the digital as a natural extension of her own personal space and identity [38]. This is an example of the concrescence of material and digital occasions in the one event of interaction, a temporal transaction whereby the machinic system and the human system work *through* one another.

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