

CONTEMPLATIVE INTERACTION IN MIXED REALITY ARTWORKS

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ABSTRACT

We propose a method of approaching contemplative interaction through an understanding of affect and embodiment that is multi-layered and multi-sited across the physical and the virtual. Such an assemblage may be found in so-called mixed reality artworks that we define as software-driven works that engage with a specific physical environment and explicitly mediate the boundary between physical and virtual space. Notions of contemplation have traditionally been associated with the viewing of static visual art rather than an engagement with interactive media, although a number of researchers and artists have recently articulated connections between these two ostensible opposites. We further develop an understanding of how contemplative interaction operates with mixed reality artworks.

Through a critical analysis of several contemporary mixed reality artworks, we identify the nature and quality of the affect cycle in relation to a distributed and hybrid expression of embodiment and its role in contemplative interactive experiences. We also examine the role of reflection, engagement and meaning in this assemblage. Finally, we assert that a meaningful experience of contemplative interaction is constituted when an interactor engages in a collaborative feedback cycle of affect between themselves and the artwork.

INTRODUCTION

Simon Penny has identified an historical transition from the decade of 'virtuality' in the 1990s to the decade of ubiquity in the 2000s with computing becoming embedded, augmented and distributed within our physical environment. [1] While Penny claims this is not a clear break from or antithesis to, the concerns of the 90s around virtuality, he highlights how these developments have challenged traditional modes of interaction. This proliferation of ubiquitous and pervasive interactive technologies has seen artists explore enacted relations between physical capacities and informational operations for creative expression. This paper examines the role of contemplative forms of interaction that can connect these spaces, codes, locations, technologies and data in mixed reality artworks, focusing on *Reproduction – an artificially evolving performative digital ecology* created by co-author Adam Nash and collaborator John McCormick.

CONTEMPLATION AND INTERACTION

Andy Polaine has observed that, until recently, approaches to interaction have been dominated by industrialized models which have prioritized functionality, usability and utility and “bogged down in behavioral response analysis and tool-based thinking [...] devoid of much acknowledgement of emotion or phenomenal experience.” [2] Similarly Alex Soojung-Kim Pang has echoed concerns expressed by authors such as Linda Stone, Brenda Laurel and Nicholas Carr by asking how interaction can be

designed to encourage more reflective and subtle modes of engagement rather than reactive or distracting approaches. [3 - 6]



Fig. 1. *Reproduction*, 2011, John McCormick and Adam Nash, mixed reality artwork.

To address this question, the above authors draw attention to notions of contemplation – a practice usually associated with religion but also prevalent across philosophy, psychology, education, architecture and art. As noted by Pang there is a pronounced interest in the wide variety of strategies and activities of contemplative practices that he defines through notions of calmness, engagement and attention. [7] Rebecca Krinke similarly moves away from escapist or passive connotations of contemplation arguing that it involves deliberate and deep attention stating, “rather than being mindlessly entranced, we are actively involved.” [8]

In considering these practices of contemplation authors such as Krinke and Pang respectively draw attention to how this engaged and reflective experience can inform interactive media. The relationship between interaction and contemplation is a relatively recent and somewhat disparate area of investigation and different approaches have been described variously as “contemplative play,” “contemplative computing,” “slow gaming,” “zen games,” “interactive contemplation,” “slow technology” and “calm computing.” [9 - 15] Researcher Lone Koefoed Hansen challenges an understanding of contemplative distance, in which our consciousness is transformed through a Kantian aesthetic contemplation of artwork, moving towards a more dynamic and embodied engagement within interactive artworks. Presenting a model for designing and evaluating how contemplation is staged through interaction, Hansen notes how artworks engage participants through degrees of physical activity or passiveness while alternating between states of immersion and reflection. She asks if the participant has to be physically active to interact or is their presence sufficient? Is the participant immersed in the experience of the artwork or are they reflecting on their interaction? [16] Here we can see that the dynamic relationship between the subject and object via contemplative interaction opens up new opportunities for experience.

With contemplation shifting from a mode of distant spectatorship to one of agency with the artwork itself our argument is that the contemplation itself has the potential to enter into a mutual cycle of affect in which both artwork and interactor are changed, if not constituted and any definition of contemplative interaction needs to take this into account.

RELATED PRACTICE

Over the last decade a number of Australian artists have created artworks that consider contemplative forms of interaction. Although Polaine says “the interactive experience may be difficult to analyze, residing as it does inside the consciousness of the interactor.” [17] Timothy Morton’s ‘speculative sublime’ describes a move away from such a Kantian idea of experience as purely a human subjective phenomenon towards a Longinus-inspired co-existence in relation to an “alien presence.” [18] Similarly, these artworks can be analyzed in terms of their operating as sites of the capture and escape of affect. [19] While there are a number of theories of affect, Brian Massumi emphasizes its relational potential rather than its emotional capacity, positing that emotion is only a partial expression of affect and a pre-individual event that occurs before consciousness. [20] Referring to Spinoza’s account of affect, in which he describes the body in terms of its capacity for affecting or being affected, Massumi says that all bodies, including the natural and artificial, enact these affects. Likewise, Deleuze uses Spinoza to assert that a “body can be anything; it can be an animal, a body of sounds, a mind or an idea,” which allows us to concentrate on bodies’ capacities for affecting and being affected, which Deleuze defines as “compositions of relations.” [21], [22] Following this line, Anna Muster and Mark Hansen have examined affective experiences that emerge from the digital. Muster claims that the intersections “between information and the materiality of our bodies involves a multiplication of affect, of the capacities of conceptualizing, perceiving and feeling embodiment.” [23] Mark Hansen’s affective body-in-code is “not a purely informational body or a digital disembodiment [...] but a body whose embodiment is realized and can only be realized in conjunction with technics” and recently extending his earlier phenomenological focus towards a more “distributed field of prehensions.” [24], [25] Concepts of code remain central to this understanding: the social codes of interacting with artworks that are partially informed by centuries of human interaction with physical environments; the ‘actual’ code itself in terms of the components of the artwork; and the digital virtualization of those codes to construct the modes and forms of interaction.

With reference to Lone Koeford Hansen’s model, discussed above, the following analyses of artworks attempt to demonstrate how these notions of both affect and embodiment might produce contemplative interaction. The analyses are based on the authors’ direct experience with the artworks, interviews with the artists, personal communication with visitors and reference to critical literature on the artworks. *Plasticology* (1997 - 2000) by Patricia Piccinini is an interactive installation which “embodies a sincere attempt to construct a contemplative space out of the stuff of the

media.” [26] Experiencing the work at the Melbourne International Biennial *Signs of Life* exhibition in 1999, the installation consisted of over fifty screens displaying gently swaying, computer-generated, glossy plants and trees. Transforming the gutted gallery space of the ex-telephone exchange building into a lush “garden of the parallel worlds of the virtual or the media,” this synthetic environment did not attempt to imitate nature but was a world with “its own climate, its own principles of life, its own nature” , This could be seen in not only the vivid forest of digital ‘ferns,’ ‘trees,’ ‘sprouts’ and ‘oak trees,’ but in the timid ‘bird’ that inhabited these surroundings. [27], [28] Placing visitors simultaneously in its artificial world and the physical space of the gallery, the ‘bird’ acts as a liminal entity that connects these spheres through its simple but enigmatic interaction. With the use of motion sensors the ‘bird’ appears fleetingly on one of the screens before flying away if approached. Although agency is limited, this playful and reflective relationship is significant as it affords a contemplative engagement with the space as a ‘living’ forest. This foregrounding of action when a visitor attempts to follow the bird transcends the fabrication of the forest simulacra, evoking what the artist describes as a striking but unsettling sublimity. Visitors are immersed in the light and movement of the garden, the ‘wind’ surging through the synthetic plants and the illumination of the glossy and fluorescent foliage altering the gallery space into a uncanny habitat of human and non-human entities. While *Plasticology* does now not rely on interactivity – with more recent iterations removing this element, it’s first manifestation was an early exploration of the interplay between contemplation and interaction that is further expanded in the projects below.

Oribotics (2003 – ongoing) by Matthew Gardiner is “a field of research that thrives on the aesthetic, biomechanic and morphological connections between nature origami and robotics.” [29] This investigation has manifested itself in a number of Oribotic installations, each iteration featuring delicate flower-like origami robots the artist terms oribots. In an early version of the work interaction with this oribotic garden was described as fostering a “contemplative relationship,” where visitors’ interactions with a touch-screen interface caused these physical constructions to ‘grow.’ With the material fragility of the folded-paper ‘blossoms,’ visitors were left pondering the limited lifespan of these transient forms, where each ‘bloom’ also caused them to wither. *Oribotics* (Atom Generation), exhibited in 2005, was similarly described as “encouraging exploration, communication and contemplation” with Gardiner continuing to “explore a loss of nature” through the creation of robotic flowers. [30 - 32] A later iteration, described by Gardiner as “a cross between gardening, messaging a friend and commanding a robot” developed this simple mechanic into a more complex relationship between the oribots, the visitors and the physical and virtual environments in which they interacted. [33] This culminated in *Oribotics* (network) installed within Federation Square, Melbourne, in which oribots were ‘planted’ on the glass panes of the Atrium to transform the public space into a greenhouse-like environment. These oribots could be ‘fed’ with news and information such as weather, stock prices and scientific

data by people either in the physical space of the Atrium using their mobile phones or remotely, via a website. Affecting the oribot's movement and color as a 'real' plant might be affected when watered, this local and global input of modulated data was intended to create an intricate feedback cycle between the oribots, the human visitors and their shared environment. While Gardiner attempted to foster a reflective engagement through this interaction, the artist acknowledged that a number of visitors were confounded by the interface, finding "the complex details of the interaction [...] a mystery," and this mystery, in practice, prevented rather than facilitated a contemplative interaction. In observing how "people intuitively placed their hand in front of the bot, in the hope of getting a physical reaction," he then set about designing a more immediate form of interaction in a later iteration titled Oribotics (the future unfolds). [34], [35] Here, people gently move a hand in front of the oribot's 'mouth' to actuate its folds, the petals delicately retracting when the hand is removed. This gesture triggers not just a single oribot, but also others near it to create a complex ripple effect as the oribots 'bloom' and light up to form a luminous flowering field. This assemblage of delicate paper 'flower bots' and digitally enabled physical interaction reconstitutes the notion of the garden, mentioned above, within the urban digital context to attempt to facilitate a contemplative interaction.

Colony (2008) is an urban art project by Troy Innocent situated within the Digital Harbour, Melbourne. Consisting of an artificial ecosystem that has been integrated into the physical site of the Docklands, *Colony* is designed as a public garden. However, this contemplative environment is invoked not through the picturesque but via emergent and evolving behaviors and processes. Giuliana Bruno points out that many traditional gardens were anything but static by drawing attention to the pleasure gardens of the sixteenth and seventeenth centuries, which featured "automata, sculptures and playful fluid mechanisms." [36] Likewise, *Colony* is 'alive' with dynamic interactions that lead visitors movement through its space. Featuring forty-two sensor-equipped totems made of weathering steel and translucent acrylic dispersed through the location, the 'organisms' of this eco-system are made of light and sound effects that emanate from the totems. Innocent explains that these effects act as a non-verbal code, with the interactivity between *Colony* and its visitors counteracting "many of the more popular forms of interaction common in digital entertainment [...] typically tied to the binary states on or off; true or false [...] for more subtle and contemplative forms of interaction." [37] Rebecca Solnit has linked gardens to 'reading' the landscape, with paths being seen as threads of a story or spatial elements equivalent to the time structure of a narrative, and *Colony* is a ludic version of this. The artwork reveals itself through playful exploration, where the act of walking becomes a *dérive*-like drift. [38], [39] First immersing the visitors through their observation of the autonomous interaction between the agents, the walk transforms the observer into an interactor, their bodies directly acting as a type of instrument as the totems respond to visitors' movement through the space. These emergent light and sound responses are also influenced through mobile devices and

smartphones, with a downloadable app allowing the visitors to playfully manipulate the totems' glyphs and sounds. Moving away from reactive cause and effect approaches, these multiple levels of interaction subtly intertwine the digital agents, the material environment and human navigation through the space to facilitate a contemplative experience.

REPRODUCTION

Reproduction similarly features layers of interaction that facilitate deep and complex behaviors, agency and affect across its multiple physical and virtual sites. The first mode of interaction operates between the digital entities that populate the work, which, although influenced by human interaction, are not dependent on it. These digital entities 'live,' 'die,' 'reproduce' and 'evolve' in response to their interactions with each other, with their digital environment and with human interactors in both the digital environment and the physical environment of the gallery space.

Each entity is governed by a simple set of audiovisual algorithmic parameters, manifesting in emergent behavior and complex aesthetics from the interaction of very basic elements. Featuring both xenophiles and xenophobes the entities attempt to organize themselves as species by attracting or repelling others. Similar to a rock-paper-scissors game, there is no 'superior' entity, the rules keeping the ecosystem in a constant state of evolution over thousands of generations. As the entities evolve, combinations of color and sound are generated which help determine how they behave with other entities. There are nine broad 'species' that are 'bred' from various combinations of visual (red, green, blue, opacity) and sonic (melody, harmony, rhythm, timbre) parameters. For example, a purple entity will need to find red and blue properties to survive and will attempt to seek these through other entities. If it isn't able to find these properties, it becomes progressively grey, 'singing' less and less, eventually becoming unable to reproduce and finally becoming inert and 'dying' by fading away completely. This plays out moment-to-moment, their modulations creating a gently shifting environment in a constant state of flux. Visitors to the installation sometimes lie down in the gallery space and contemplate the environment as they might the night sky or actively move around experimenting with the changes and through all these interactions the work further evolves, every participant – physical and digital – tracking and interacting with the permutations as they occur.

Traversing the physical and virtual habitat of this 'ecosystem' evokes a speculative pleasure as we move through, seeking sites and moments of interaction. Building on co-author Adam Nash's practice in virtual 3D environments that have been described as "virtual emotional geography [...] immersive, contemplative spaces," *Reproduction* investigates this form of engagement within a navigable mixed reality. Designed to be explored slowly, the work rewards reflective interaction. As noted previously by the co-author games scholar Bernadette Flynn discusses this contemplative mode of engagement in her research on the semiotics of spatial

practice arguing that navigation operates as a central organizing principle “around which ludic and aesthetic experiences take place.” [40 - 42] In *Reproduction*, this engagement is across the gallery space and the digital world, our navigation forming a close symbiotic relationship as both the human interactor and entity learn from each others’ movements and behavior.



Fig. 2. Digital entities of *Reproduction*, 2011, John McCormick and Adam Nash, mixed reality artwork.

This relationship is formed as soon as visitors enter the physical space of the gallery, their presence, detected by motion-capture devices, causing a digital entity to spawn. Joining other existing entities of the ‘ecosystem,’ this newly created entity is closely linked to that person, following them in the space and adjusting its audio and visual characteristics according to their movement. This creates a close association, not only in terms of visual tracking, but also in establishing an emotive connection. Nash uses a similar device in an earlier work titled *The Moaning Columns of Longing* (2007), where a relationship is cultivated with an emotionally needy and manipulative digital agent, in that case a swaying white column, that responds to a human avatar’s presence in an online multi-user digital environment. This geometric artificial ‘life-form’ exists only in relation to a specific avatar; in a similar way, a visitor’s virtual entity is spawned as they enter the installation of *Reproduction* and associates itself with the visitor, but is also ‘aware’ of its relationship with other digital entities in the environment. The entity ‘sings’ to the visitor, trying to learn and anticipate the sounds it believes the person likes. If they are standing still the entity interprets this as an indication the person is enjoying the composition. If they move, the entity will follow and sing to them in an attempt to entice them to stay, all the while remaining ‘wary’ of its surrounding digital environment and any potential ‘danger.’ Our engagement with *Reproduction* deepens as the subtleties of the entities are gradually revealed, interactors forming a bond with ‘their’ entity as they observe and influence its behavior and life cycle. This is further nurtured on the web by users who access the online environment of the entities. The ability to simultaneously interact in real-time across a range of persistent and portable platforms engenders an intimate relationship with the entity as we come to know it and the complex world it inhabits, over time.

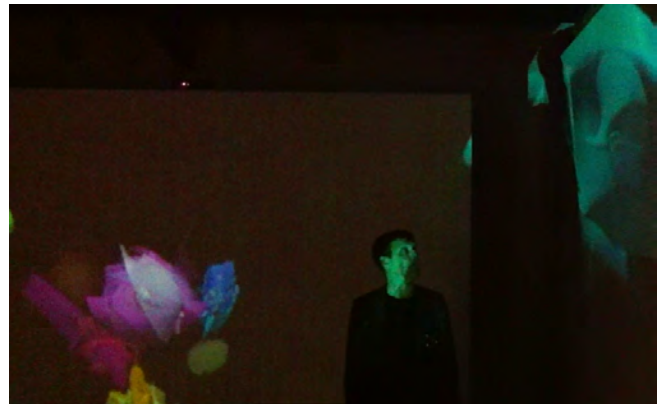


Fig. 3. *Reproduction*, 2011, John McCormick and Adam Nash, mixed reality artwork.

This interaction of *Reproduction* involves an affective-contemplative relationship between human and non-human entities. We argue this contemplative engagement with the visual, spatial and sonic relationships of the work can be understood via the feedback cycle of affect that initially occurs between human interactors and the artwork. As flagged earlier, Deleuze’s “compositions of relations” and associated theories of affect is a useful way of thinking about the affective capabilities of the emergent digital entities of *Reproduction* – between themselves, between them and the virtual environment and between them and human interactors. [43]

Although we are in no way attempting to analyze the subjective experience of the digital entities or even submit that such a thing exists, we are suggesting a diminution of the privilege of the human subjective experience in such a contemplative interactive artwork and we do this, as discussed earlier, via a Deleuzian reading of Spinozan bodies and a concern with an expanded sense of embodiment as laid out by Anna Munster and Mark Hansen. Jane Bennett similarly draws on Spinoza and Deleuze to discuss ‘vital materialism’ which explores human-non-human assemblages and distributed agency. [44] In *Reproduction*, the human and non-human come together into a composite feedback system and form a shared role in assembling the work.

CONCLUSION

This paper has proposed a method of analyzing contemplative interaction by examining notions of affect that relate bodies, locations, spaces and codes across the physical and virtual. We have investigated and described the affective relationships that operate within the mixed reality artwork *Reproduction*: the affective relations between the digital entities and other digital entities; the affective relations between the digital entities and their human interactors; and the affective relations between these and their physical and digital environments. We contend that a symbiotic feedback cycle is established that facilitates reflective responses in human interactors that mediate our relationship with digital media and each other in subtle and profound ways while interacting with the artwork. These experiences are described as contemplative interactions.

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