

RADICAL IMMERSIONS

NAVIGATING BETWEEN VIRTUAL/PHYSICAL ENVIRONMENTS AND INFORMATION BUBBLES

DRHA 2019

Watermans Arts Centre 8-10 September 2019

Conference Proceedings
Edited by Elena Papadaki

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NAVIGATING BETWEEN VIRTUAL / PHYSICAL ENVIRONMENTS
AND INFORMATION BUBBLES

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CONTENTS

- 08 Sue Broadhurst - **Welcome from the DRHA Chair – Opening of the Conference**
- 10 Elena Papadaki and Dani Ploeger - **Introduction to the Conference**
- 12 Michael N. Goddard - **Immersive Media, Virtual Reality and Histories of Audiovision**
- 20 Sarah O'Brien - **Performing the Zombie in Phantasmagorical Extended Reality (XR)**
- 26 Olu Taiwo - **Subjugating Other Cultural Narratives in the Construction of Immersive Environments**
- 32 Andreas Schellewald - **How to Approach the Coupling of Objective Appearances and Subjective Purposes?**
- 38 Melanie Chan - **Radically Immersed in Narrative: Body, Space and Technologically Mediated Experience with Virtual Reality**
- 46 Matt Lewis - **How Can we Listen with Our Future?**
- 52 Vince Dziekan - **A Synoptic Overview of Virtual Reality and Museological Space**
- 60 Gabriella Giannachi - **Documenting Hybrid and Participatory Artworks: The Role of the Audience**
- 72 Livia Nolasco - Rózsás - **The Virtual as a Condition and Its Implications for the Exhibition Space and Artistic Production**
- 78 Zsolt Bagi - **Immersion and the Reign of the Opinion: The Power Relations of the New Baroque**
- 88 Carly Whitaker - **Iterative Curatorial Patterns of a Networked Residency Programme**
- 96 Einav Katan-Schmid - **Playing with Virtual Realities: Navigating Immersion within Diverse Environments**
- 106 Rosell Meseguer - **Petrographic Field Guide**
- 114 Cândia Borges and Gabriel Mario Vélez **The Transeuntis Mundi Project: An Immersion into Human Cultural Heritage**
- 120 Joseph Delappe - **The Virtual Paintings: Representing Virtual Contexts through Traditional Media**
- 124 Raquel Caerols Mateo - **The Contemporary Museum: Immersive Proposals. A Taxonomy**
- 130 Raivo Kelomees, Varvara Guljajeva and Oliver Laas - **Strategies of Engagement and Attraction in Interactive Artworks**
- 138 Christian Riegel and Katherine M. Robinson - **Disability, Ableism, Eye Tracking, and Art Creation as Disruption**
- 146 Grayson Richards - **New World Synthesis**
- 156 John Desnoyers-Stewart, Megan L. Smith and Bernhard E. Riecke - **Transcending the Virtual Mirror Stage: Embodying the Virtual Self through the Digital Mirror**
- 168 Eleanor Dare - **Rendlesham 360**
- 176 Vita Berezina-Blackburn and Alex Oliszewski **Devising Interactivity in Virtual Reality Informed by the Dramaturgy of Immersive Theatre Practice**
- 196 Conor McGarrigle - **#Riseandgrind: Lessons from a Biased AI**

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WELCOME FROM THE DRHA CHAIR – OPENING OF THE CONFERENCE

Dear Delegates,

I am very happy to welcome you all to the 2019 Digital Research in the Humanities and Arts Conference: 'Radical Immersions: Navigating between virtual/physical environments and information bubbles', hosted by the Central School of Speech and Drama and the University of Greenwich – otherwise known as Dani and Elena.

At the same time, we have aimed to achieve what DRHA has always achieved, which is the provision of intellectual and physical space for cross-disciplinary discussion and ideas generation. Many new networks have been established and productive research relationships initiated. As with all dynamic conferences, we hope that debate inside sessions is continued in the corridors, social sessions, and meetings outside.

The space provided for us this year is of course here at Waterman's Art Centre, London. The Programme includes contributions from digital humanities and arts, including, the field of digital immersive tools, and also: creative industries, archives, museums, performance, installation, dance, music, and cultural theory, which will no doubt generate their own collaborative practices and enable intriguing dialogues during the conference.

We are so pleased to be able to bring DRHA to a space known for its innovation in many of the disciplines attending this year. I would like to thank all the local and programme organisers for their energy and creativity in building this event. Finally, I would like to thank you as delegates, in advance, for the contribution you will no doubt make to such a special gathering. So, welcome to 'Radical Immersions', London and DRHA 2019.

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Over the past years, immersive technologies have been hyped as consumer gadgets, entertainment media and the future of exhibition practices. The free distribution of VR headsets with smartphones and the increasing interest of museums, festivals and other cultural organisers towards 'immersive digital content' have quickly turned VR and AR devices and applications into widely recognized cultural artefacts. The promotion of 'full immersion' in the physical spaces of exhibitions and museums has led to some venues relying solely on interactive projections and audience interaction. However, just like many earlier 'new media' before them, the hyperbolic promises attached to these technologies' supposed capacity to deliver immediacy and trigger a paradigm shift in media culture have thus far hardly become reality.

Meanwhile, social media platforms enable the formation of communities where members immerse themselves in alternate networks of signification in which conspiracy theories are embedded in seemingly consistent information clouds. While these information bubbles are often – but not necessarily correctly – associated with economically and socially disenfranchised communities that reject intellectualism, they can also be read as reflections of some of the keystones of post-structuralist thought, especially in their fostering of a rhizomatic approach to 'fact finding' and a consistent suspicion that the everyday is in fact a 'hyperreal' constructed by entities of power.

The Digital Research in the Humanities and Arts (DRHA) conference 2019 examined these two perspectives on immersion in digital culture and identified some of their broader ideological frameworks as well as provided detailed insights into the workings of specific technologies in relation to their promises.

The invited papers and poster presentations addressed questions including, but not limited to, the following:

- How are the promises and expectations of VR, AR and other immersive consumer technologies embedded in broader cultural ideologies of progress and innovation?
- What are the tensions created between immersive technologies and physical environments?
- How is the space between an all-digital artwork and an all-physical exhibition space negotiated?
- How do the material aspects of immersive technologies' hardware affect the generation and perception of immersive content?
- How might the design, marketing and use of digital platforms determine the ways in which online information communities are formed?
- To what extent might online 'filter bubbles' and other immersive information environments bear parallels to post-structuralist understandings of rhizomatic and fluid meaning-making in text?

In parallel with the conference, a group exhibition was presented at Watermans Arts Centre (6-20 September 2019), organised by Klio Krajewska (Head of New Media Arts Development, Watermans), Elena Papadaki, and Dani Ploeger, following a call for artworks. Along the lines of the conference theme, the selected artworks critically engaged with immersive technologies, news media, and digital culture.

The conference convenors gratefully acknowledge The Royal Central School of Speech and Drama and Watermans Arts Centre for hosting the conference and exhibition.

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Abstract

When virtual reality 'first' appeared on the scene in the 1990s, its philosophical, and even metaphysical, potentials were not lost on several authors whether they perceived them in largely dystopian terms (see Kroker 1993) or naively affirmative ones (see Rheingold 1991). Perhaps the author who most intimately connected virtual reality and philosophy was Michael Heim, whose work *The Metaphysics of Virtual Reality* (1993) situated technologies of the virtual as ontological machineries, enabling the practical design of modes of experience that philosophers had hitherto only been able to imagine; to paraphrase Marx, where philosophy had only been able to describe the world, virtual reality designers were making new worlds of ontological experience available to their users. Of course, Virtual Reality is only the last of a long line of immersive technologies of perception in the twentieth century, passing through all the technological innovations of cinema, stereoscopy, 3D and other immersive media whose deeper history dates back to panoramas, Viewmasters and other devices, and further to such philosophical machineries as Plato's cave. More specifically, virtual reality emerges out of an intersection between audiovisual moving images and sounds and computing, that began as early as the 1960s, as so many varieties of what Gene Youngblood called 'Expanded Cinema' (1970). This paper will explore these genealogies of virtual immersive technologies as modes of practical aesthetics, enabling concrete experiences of perceptual transformation and metamorphosis, a becoming other to oneself and one's habits of perceiving and being in the world. It will argue that rather than the transcendence often attributed to

these experiences in the 1990s that immersive technologies of the virtual open up space of pure immanence and becoming which may exceed the sensoria of habitual lived bodies, but only by creating a new body without organs, a 'new flesh' of technologically remediated pure immanence. As such it will situate contemporary VR in longer and buried histories of the non-linear development of virtual and immersive technologies going back at least to 1960s expanded cinema, and explore its artistic potentialities in the present and future.

Oculus Rift: The magic of presence

Rift's advanced display technology combined with its precise, low-latency constellation tracking system enables the sensation of presence – the feeling as though you're actually there. The magic of presence changes everything. You've never experienced immersion like this (Oculus Rift Webpage, 2017)

Introduction

Hype like this, which is basically advertising for a commercially available Oculus Rift VR headset and related content give the impression that Virtual Reality is a new, emergent phenomenon, facilitating never-before-experienced potentials for 'immersion', 'presence' and perceptual realism. Such claim to novelty should give anyone attuned to cultural histories of technology pause, and especially if we want to adopt a media archaeological perspective, attuned to both what is old in the new, as well as what is new in the old. Virtual Reality, and the dreams of total presence it sustains is especially prone to periodic bouts of historical amnesia, so much so that reading contemporary 'practical' accounts of VR it is as if it has no history. However, if one retains any memory, or does any research into, cybercultural discourse of the 1990s, one can find here both the same if not more prominence accorded to VR, and an even greater level of hype, in some instances, as well as paranoia in others. As with other audiovisual media technologies like 3D and stereoscopy, technological development is cyclical rather than progressive, with different technical assemblages returning when conditions, whether technical, economic, cultural or all of the above are right. Furthermore, VR is not a distinct, isolated phenomena but part of a continuum of technical devices and assemblages including such dominant ones as cinema and television, as well as more specific arenas such as cinema special effects, histories of simulation, and conjunctions

between moving images and computing that go back at least to the 1960s. With this in mind, this talk will attempt to sketch some potential genealogies of VR, in relation to the broader field of what I am calling after Siegfried Zielinski, *Audiovision*.

VR and Genealogies of Audiovision

In this talk, I am situating VR as part of a broader history of audiovision in several interlocking ways. Siegfried Zielinski proposed the term "audiovision" as an alternative way of understanding both cinema and television as "entr'actes in history", meaning as contingent and far from stable assemblages, enabled by practices of invention that have also led to other audiovisual forms that are "no longer film, no longer television" (See Zielinski 1999). While he acknowledges theories of the cinematic apparatus in his introduction to this work, it fundamentally goes against static ideas of any 'basic apparatus' as theorists like Baudry proposed, and is much more in line with Cassetti's appropriation of the concept of the assemblage, to account for the cinematic as dispersed across a heterogeneous post-cinematic field. What all of this has to do with VR is that while going further than other post-cinematic modalities in terms of levels of immersion and interactivity, even apparently dispensing with the need for a screen or interface, it nevertheless remains post-cinematic because still concerned with moving image and sound environments, even if augmented by increased tactile potentials via sensors. The latter also brings up the importance of sound in VR and experiences of immersion more generally; while initially considered to be primarily a visually defined experience, increasingly sound, as Frances Dyson argues, has proved essential in actually generating the sought after senses of immersion

and presence (this has also proven to be the case in cinematic special effects development in which the development of sonic effects was arguably more sophisticated and in advance of visual SFX).

But there is another more specific reason to relate VR to genealogies of audiovision, namely that it emerges directly out of the intersection of computing and specifically computer interfaces and moving image technologies, a process that began in the 1960s but really accelerated in the 1990s. Initially these technologies had little in common as cinematic moving images were industrial, mechanical technologies for simulating illusions of real movement and thereby facilitate new forms of narrative, whereas computers were largely concerned with calculation, and its software was either algorithmic or related to technologies of writing; hence the first technological coupling of the computer was with the typewriter, not with anything audiovisual. However, as computers started to become a more graphical medium in terms of both interfaces and at the level of now object oriented software, its artistic applications became increasingly apparent leading to computer art, which soon took the form of moving images. Similarly, innovative filmmakers wanted to go beyond the possibilities not only of the photographic images but even of analog varieties of animation, and turned to computer animation as a way to achieve this. This intersection of cinema and computing played a key role in what would be named by Gene Youngblood "Expanded Cinema" (1970), which is really where virtual reality begins.

Primal Scenes of VR: *Vertigo* (1959) and the Stargate Corridor in 2001; A Space Odyssey

Alfred Hitchcock certainly was one of the filmmakers open to innovations in visual arts, up to and including early computer animation. In the film *Spellbound* (1945) he invited Salvador Dali to create the sets for scenes that was less

a dream sequence than the psychoanalytic recall of a dream; but while these Daliesque images were striking in their deliberate artifice, they were also somewhat corny and stagy, reminiscent of the artificial sets of German expressionist films of the 1920s. For some of his later films, Saul Bass had already been creating abstract animated sequences but for *Vertigo* he wanted a series of rotating abstract geometric figures that should be mathematically precise. They turned to the artist John Whitney, who had already been experimenting with these kinds of moving images, by adapting WWII military technologies for rotating anti-aircraft guns:

Whitney realized that the gun director could rotate endlessly, and in perfect synchronization with the swinging of a pendulum. He placed his animation cels on the platform that held the gun director, and above it suspended a pendulum from the ceiling which held a pen that was connected to a 24-foot high pressurized paint reservoir. The movement of the pendulum in relation to the rotation of the gun director generated the spiral drawings used in *Vertigo*'s opening sequence.

However, Whitney had also been developing his mandala like computer animations independently, producing work with a hypnotic and immersive quality. The ultimate realisation of such practices cinematically was in the famous 'Stargate Corridor' sequence of *2001* in which the special effects supervisor Doug Trumbull turned to such experiments in order to create a new technique for producing special effects, the 'Slit Scan technique'. This was developed by Whitney in order to generate continuous variation of abstract shapes, but then modified for the film by making it more three dimensional.

While this was all a purely analog process the effect of the final sequence was absolutely formative in terms of the look of future computer animation and also the imagination of cyberspace both in science fiction such as the equally formative *Neuromancer* and

in the development of cyberspace itself as a multidimensional graphically generated space functioning as an interactive virtual world.

All of these example were central to Gene Youngblood's conception of *Expanded Cinema* which, while having its roots in experimental animation, was already having a marked influence on Hollywood; and in a sense these experimental practices already crossed commercial and creative worlds in new ways; developing out of a fine art context, they nevertheless found application for use in title sequences, logos and advertising, a tension that would continue to mark technologies of virtuality. While John Whitney's children would continue his work by becoming computer programmers, it was really George Lucas who fully brought digital technologies into the world of Hollywood filmmaking, and not just for title or dream sequences; these technologies would become essential for the *Star Wars* franchise, but also the development of digital effects through his Industrial Light and Magic Studio and its computer animation offshoot Pixar- Youngblood did a television interview of Lucas in 1971 as a 'Maker of Films' in which these tensions are almost painfully apparent in the young, not yet appreciated filmmaker.

Back to the 1990s, Back to the Future

There are several accounts such as by Hillis (1999) and Heim (1998) of the direct history of VR including such things as Viewmasters and 3D stereoscopy, flight simulators as developed in the 1960s, and Ivan Sutherland's 'Sketchpad' 'an interactive program that enabled a user holding a light pen to make designs on a screen that could be stored, retrieved and superimposed' (Hillis, 1999, 11). Later he developed the concept of the 'ultimate display' in which the computer would control the existence of matter, resonating with and extending earlier theories of 'total cinema'. Finally there is the development of head mounted displays, compared by Howard Rheingold to

'exceptionally bulky sunglasses', and data gloves which more fully enable the experience of virtual environments by in principle eliminating both the screen as interface and the bracketing out the perception of surrounding reality.

It is this suspension of one's lived spatial reality and its substitution with another that led many writers and developers to see in Virtual reality dreams of transcendence of the body and hence the facilitator of a form of disembodiment. But here were always voices cautioning against this kind of approach. N Katherine Hayles, for example, writing in 1996 that "As anyone who designs VR simulations knows, the specificities of our embodiments matter in all kinds of ways, from determining the precise configuration of a VR interface, to influencing the speed with which we can read a [...] screen" (Hayles, 1996). If there is nevertheless "so much noise about the perception of cyberspace as a disembodied medium" (1996, 1), it is due to making a cut between the embodied experience of the user and the alternate virtual world, the attribution of more reality to the latter, due to the desire to leave the former behind, by disavowing the technical and perceptual process by which it is generated in the first place. This is a precise articulation of the differences between posthuman immanence and transhuman transcendence. The gendered nature of such fantasies of disembodiment hardly need to be spelled out or repeated, and by now have been fully critiqued; and yet such desires and fantasies still attach themselves to VR, and are as hard to shake as the implications of its military origins as artists like Harun Farocki have explored. As more perceptive commentators noted, VR might have less to do with *Neuromancer*'s fantasy of leaving behind the 'meat' of the organic body and more to do with pattern recognition: "people have something to lose if they are regarded solely as informational patterns, namely the resistant materiality that has marked the experience of living as embodied creatures" (Hayles 1993). Such a polarisation between transhuman and

posthuman accounts of VR seem today to be exaggerated but are understandable in the context of 1990s speculations about VR and its future as a synecdoche for cyberspace itself: the idea that we were on the verge of a world in which we would all be engaging in virtual environments for most of our activities (in an era when even email was relatively novel). In actual fact the dreams and anxieties surrounding VR barely survived the dotcom crash and until recently it seemed consigned to being just another technological novelty, suitable for amusement parks and the peripheries of gaming. One problem was the hype itself which was basically impossible to live up to, and another was the level of technological development; certainly there were some admirable experiments in VR art, but their realisation was not the overwhelming technological experience it was supposed to be; in other words, the fantasies of immediacy, of surpassing the need for an interface, returned in the form of effects of hypermediacy in anything from the delay time of loading necessary information, to so called "Alternate World Syndrome" which could leave some users in a state of nausea and disorientation. Taking as an example the VR experience "Dancing with the Virtual Dervish" is that far from an experience of disembodiment it was, in fact, all about kinesthetic and proprioceptive embodiment.

Michael Heim describes the after effects of his two and a half hour experience with this work in the following terms:

Even the next day, my optical nerves held the imprint of the brightly coloured transhuman structures. I could summon them with the slightest effort – or see them sometimes in unexpected flashes of cyberspace. (Heim, 1998, 51-52).

Of course, much of this kind of embodied reaction or abreaction to virtual reality had to do with levels of technological development; too low a frame rate apparently produced such effects, a problem that has since been overcome

in 21st Century VR apparatus's with much higher processing rates and hence the ability to generate more seamless virtual environments. But the problems with 1990s VR were not just a question of technical obstacles, high costs and lack of a clear idea of its potential uses; there was also a fundamental misperception of what its affordances and limits were, namely that what it enabled was not an experience of immediacy, of being transported into another body in another space, but just another modality of remediation. This perhaps accounts for VR being eclipsed in favour of other technologies, principally mobile smart phone and augmented reality developments that dominated the first decade of the 2000s, and which foreground rather than hide their processes of hypermediation. Nevertheless, in a nice irony, mounting a VR enabled phone within a headset has become a new way of generating VR experiences, rendering them cheaper and more accessible. Conversely the supposed next step forward in augmented reality in such devices as Google Glass has met with unanticipated unpopularity in its adding of new layers of surveillance or at least interveillance to a world already saturated with such practices: don't objectify me into my data body, at least not so obviously.

This underlines the point that VR does not do away with the screen or interface, so much as render it imperceptible, displacing it to the non perceived display or even the retina. But how new is this process? Are cinemagoers ever aware that they are watching a screen when immersed in a spectacular cinematic presentation, especially when immersion is aided by HD or IMAX technologies, complex sound environments, or 3D effects? Is VR just the latest in a line of immersive audiovisual technologies, a kind of post-cinematic supplement or actually a medium or artform in its own right?

I am not at this stage of my research to give definitive answers to these questions, but I think that other than medical and military uses of VR, it is now being developed largely as a way of

producing supplementary content, extending the repertoire of games, cinema, especially animated cinema, music video and slightly more sophisticated versions of virtual environments already well known from MMORPG's like *World of Warcraft* or even *Second Life*. Certainly VR has progressed from being limited to use by either military-industrial or artistic elite projects, to becoming more available and accessible, as well as becoming commercialised as a desirable consumer product, but whether it will develop some of the artistic, let alone the ontogenetic potential imagined for it in the 1990s, still remains to be seen. Certainly if the works produced by Oculus Studios are anything to go by, things have not yet progressed all that far beyond Pixar animations.

Tentative Conclusions

Perhaps some greater inspiration for designing really artistic VR experiences might rather be gained by re-engaging with the lesser known histories of expanded cinema, audiovisual experimentation and computer art and special effects presented earlier, which might form the basis of some really interesting immersive and ontogenetic experiences; something like a VR equivalent of *Twin Peaks The Return*, episode 8, a kind of negative Stargate Corridor, could be a more aesthetically challenging starting point.

At any rate it seems important to find a point somewhere between the banality of discourses surrounding contemporary VR and the speculative spasms of the 1990s, in order grasp what is really, potentially new in VR, while remaining fully aware of its limits and affordances.

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Abstract

In her study of phantasmagorical film and literature, Marina Warner states that it is the zombie that 'embodies the condition of our time' as they represent contemporary experiences of selfhood shaped by new technologies (2006: 357-8). In this paper I suggest that, due to the interactive and immersive qualities of XR (a term that includes VR, AR and MR interactive experiences), the concept of the Zombie in some recent gothic expressions does not just represent contemporary experience but is an 'interpassive' role (Pfaller 1996; Žižek 2008) performed by the participant, where our agency is objectified and forms part of the act. In putting forward this case, the paper focuses on two recent XR events that strive to reclaim the authentic self in what can initially be seen to be a plight to recover modernist authenticity. The first is 'Whist' (2017) by AΦE, where there is an attempt to reify the self through the trigger of the participant's gaze using a Freudian discourse. This results in an interpassive experience that could be seen to distance the participant from their own agency; rather than interpret the self, Freudian discourse is seen to possess it. The second is 'Doom Room' (2018) by Makropol, where there is an attempt to reclaim the soul through an Artaudian re-birth via self-sacrifice. In doing so, 'Doom Room' entwines the story of interpassivity with the zombie experience.

Keywords: Virtual Reality;
Gothic; interpassivity;
participatory performance; zombie.

Introduction

In 2015 immersive artist and film director Chris Milk stated in a TED talk that VR has the ability to be "the ultimate empathy machine" as it can make us become "more human". Milk's vision of VR, and XR in general, is widespread – there is a wealth of writing and practice on VR and empathy, where VR has shown the social realities of racism and homelessness; experiences of living in refugee camps, detention centres, war zones; and even what it's like to be a cow in a slaughterhouse. But, in the contemporary imagination, another narrative exists that serves as an uncanny underside to this technological utopianism. In the popular imagination are dystopian futures, in which these new technologies are taking away our humanity. And, what is interesting, is that these interactive creative practices have, arguably, become more popular than the utopian vision.

Interactive horror events in the west can be traced back to Victorian Phantasmagoria. This general fascination with the irrational, the ghostly and the macabre has grown from a larger body of work from literature since the Enlightenment, known as the gothic genre. The gothic has been said to be a platform where anything that cannot be rationalised in our post enlightened comprehension of the world, can be expressed as an anxiety within art. It can be seen as a kind of Catharism: a release; a place to play out ideas that ruminate in our minds, and even perhaps experiences, but have no place in a rational world.

There has been a growing appetite for interactive psychological horror; especially via digital games and popular events. This marks a change or development of the gothic because now our bodies and spaces are physically involved, and, our decisions are an essential part of the narrative – we now have interactive gothic

experience. This appears to be antithetical to our general utopian idea for what we want from interactive technologies. Do we really want to be disempowered, undermined, bullied? Gothic interactive horror is far from an empowered extension of the self.

The gothic genre emerged around the time of the Enlightened subject and has been said to be a cultural response to contemporary anxiety around cultural change following scientific development. Early gothic works made monsters of the medieval and the spiritual to make way for the logical scientific enlightened subject. Kelley Hurley has pointed out that the gothic revival of the last decades of the 19th Century were more horrific in graphic and visceral representations because of the anxiety generated by scientific discourse that 'served to dismantle conventional notions of the human' (Hurley 1996: 4-5). Such as, for example, evolutionism, sexology and criminal anthropology. The gothic content of the late 20th century has dismantled ideas of the nuclear family, race, gender and sexuality and the postmodern subject.

So, what do contemporary expressions of the gothic tell us about our time? And how have changes in technology, particularly XR, developed these expressions?

In her 2006 book on Phantasmagoria, Marina Warner states that 'Zombies embody the principal ghostly condition of our time [...]' (357).

The zombie was uprooted from its origins in the African diaspora of the Caribbean, and the slave condition which it embodied has shifted ground, from its historical and actual relation to economic conditions of labour, to a broader psychological description of human existential diminishment.

Yet the concept of the zombie crystallised a state of being that does still remain in play between holders of different levels of power—masters and slaves, men and women, owners and employees. (Warner 2006: 367)

Zombies convey a danger to individuality and self. 'They are flesh and blood, but that is all. [They] are more silent than ghosts, but they resemble them in that they are forced to live in suspended time [...] (Warner 2006: 358). Warner's focus is on film and literature. Here, I want to examine how, due to the interactive and immersive qualities of XR, the concept of the Zombie in gothic XR, is not one to be watched but an 'interpassive' role that we play as participants, where our agency is objectified and forms part of this act.

I have selected two XR events that engage with gothic themes: each promise the transcendence of the conscious self – be it a discovery of our own subconscious, or the rebirth of our reality. In striving for this, anxieties about self-possession and agency arise. The first is *Whist* by AΦE, where, rather than interpret the self, Freudian discourse is seen to possess it within a virtual experience that distances us from our own agency. The second is *Doom Room* by Makropol, which engages with interpassive themes of sacrifice that give context to an ending where there is a surreal loss of intersubjective reality. As with many gothic approaches to the interactive experience, each dominate the trajectory and behavior of the audience. But interestingly, in their attempts to dismantle the rationality of the VR machine, each also point towards the 'interpassive' role of the audience in very different ways.

The Role of the Zombie as Interpassive Experience

Janet Murray points out that "[VR] is [...] not an empathy machine," "[it] is an interactive medium...we want it to respond to us." (Murray, 2016). She states that what makes people

deeply involved is agency through interaction. Embodied personalisation is fundamental to interactivity in VR. When describing his experience of *The Machine to be Another* by BeAnotherLab, Liam Jarvis states that "[...] a proprioceptive 'possession' occurs in which the sensations of my body are referred to the other's mediated bodily appendages' (Jarvis 2017). VR therefore has the capability to possess our agency, whilst, contrarily, giving us the capability to possess, or consume, the other through interaction. This double edge of a personalised approach to audience participation has been expanded upon by Adam Alston within the context of immersive theatre via his concept of Narcissistic Participation.

[This] is [where] productivity is rewarded with the promise of intense, meaningful and personally valuable experiences that are not just the result of audience reception, but involvement in aesthetic production. (Alston 2016: 35).

Alston claims that it is the consumer's personal experience that becomes a commodity that the consumer consumes. But zombies wish to feast on the living, not the dead, so when our agency is objectified and repackaged as an object the result can be an interpassive one. For a system to support independent agency it must first offer a position in which the participating subject is given the space to co-produce with, or operate beyond, the feedback loop of design. Interpassivity is where the object or the 'other' (e.g. the work of art, the 'chorus' in theatre) does the 'enjoying' for you – it 'observes itself' – providing its own system with the feedback it requires so you are freed from doing so (Žižek, 1997 and Pfaller (2000) 2017). Within an interactive system then, the interpassive experience can be the pleasure gained from consuming the self as objectified.

In *Whist* by AΦE, audiences navigate between a physical installation and a virtual house in which Freudian narratives are re-enacted. Your journey through the house is said to be one of seventy-

six possible routes and this is decided by where you look within each virtual room. Productivity here, can initially be seen to be the focus of your gaze, and the reward is the personalised journey that leads to an online 'result' that reveals your unconscious desires.

When hovering in a room with the ground seemingly two metres below my feet I was witnessing my usually subconscious habit of thinking I should be in touch with the ground in visual situations like this. I hovered like a ghost, silently, voyeuristically, watching a man fight with himself for having sexual feelings for his mother. The environment evoked this 'affect'. My anxiety about hovering in the air was irrational – I cognitively knew I was firmly on the ground. So although I was co-producing my experience, it was in a non-collaborative way more akin to being possessed. My anxiety came from the fact that my agency in the piece was presented as a *trompe l'oeil* within a more dominant fiction of the immersive environment.

Whist developed this further through the framing of digital personalisation techniques within the Freudian story of self. When the human gaze acts as a trigger this can be associated with having agency within the VR world (Kosek, M et al 2017: 8). In *Whist* this 'agency' is structured like a choose your own adventure story, where your gaze decides the next room you enter. Further to this, each room works like a Rorschach image where your activity of 'seeing' is said to reveal something deeper about you that you did not already know. But in practice, the experience felt to me more like a Deleuzian highway where you can move freely but still be perfectly controlled. Discovery of the true authentic self is countered by mechanical reproduction. But it is not only that your "vote" in this choose your own adventure is prewritten, it is also that it is not "your" vote. The game design decides, and, through the frame of personalisation, it is said to be you. It is said to be your unconscious. But if the unconscious decides there can be no possibility of intention. In this way, *Whist* re-

presents Freudian discourse not as that which liberates the soul, but as that which takes ownership of it though an interpassive zombie-like experience.

Doom Room by Makropol frames a journey of transcendence through a pseudo-Christian-Artaudian discourse of ritual, raw flesh eating, raw hearts and body washing leading to self-sacrifice/suicide and re-birth. Leaving the VR experience at the end of the performance is framed as a re-birth into our renewed reality, positing the VR as a kind of womb. Here, the fantasy of returning to the womb, a repressed infantile complex, is uncannily revived.

Doom Room begins with a live performance where six audience members engage in a cult-like ritual led by one very dominant performer, leading to the second half which is in VR. In making the live performance experience a very dominant one, a direct comparison to how is provoked between the domination of self via intersubjective experience, to the domination of the senses typical of VR. In the intersubjective experience, although being bullied and physically manipulated (into holding a sheep heart, for example) I still knew that I had the choice not to 'give good audience' (as Heddon et al would say, 2012). I could refuse to play submissive and this 'fight' could be framed within the collaborative productivity of the art. In the VR experience my view was in first person where I was met with repeated visions of my 'own' suicide. Post enlightenment, suicide is seen to be an act of illness. To assume that there is a 'cure' for the symptoms of such a radical choice is to deny its 'voluntary nature' (Higonnet, 1985). However, in literature, it has also been seen as a last attempt at self-possession through a profoundly private experience (Higonnet, 1985). By framing suicide within a text of mindfulness, *Doom Room* presented it, for me, as a chosen a rite of passage into the next life. But this reclaiming of the body (the soul) through suicide – this retreat toward the flesh and its promise of transcendence via self-sacrifice – is divorced

from the will of a character. The character being mapped onto this act is the participant who is merely a witness, with the most basic level of VR interactivity – a head in a bubble. This is the ultimate staging of interpassivity where the other endures it for ‘me’ but I am the other. As a zombie I am dead but I am active.

During the re-birth the VR shows me a recording of the room I am physically standing in. A man in the distance begins to approach me slowly and steadily. I wonder whether it could be AR as I get the sense he may actually be there. As he gets closer I had no idea whether I was watching AR or VR, but I began to sense his actual presence. I could see him in double yet I could not see him at all, and he was getting closer looking at me in the eyes. The agency I could regain within the usual intersubjective encounter was not possible under these circumstances. He lifts my visor to ‘restore’ my vision. This should restore the intersubjective encounter that orientates me as a subject and agent. But instead it reveals the fundamental illusion of the situation ‘I see myself seeing myself’. Indeed, this event came immediately after a final scene in the VR world where a woman walks towards me, unmasking herself to reveal a covered mouth and blind eyes – and, after having my visor lifted, this is exactly how I felt.

Conclusions

Claire Bishop recalls the pleasure that interpassivity can have when examining what she calls ‘delegated performance’. She refers to Pierre Klossowski’s thesis (1970) that argues there is a ‘mutual imbrication of the economy and pleasure’ and delegated performance places the artist in a ‘Sadecian position, exploiting because s/he knows from experience that this exploitation and self-display can itself be a form of pleasure’ (*ibid*, 233-236). Here, the artist is interpassively gaining pleasure through the delegated performer, but the performer is also gaining pleasure from being seen to ‘play out’ these interpassive activities. XR in the

Gothic genre celebrates the dispossessed and repossessed and is also a model that collapses doubles and offers ambiguity. The Gothic disorientates our clear rational understanding of the dichotomies set out by the rationality of the Enlightenment and VR is able to develop this experience into an active/passive role. It does this by disorientating us and making us question the limits of what we are (and what we are not) and how much that can be measured by what we do (and what we do not do). Interpassivity can be pleasurable because we play out the romantic and Cartesian belief that the activities of the body is not where the self lies. I am interacting, but only physically, my body is doing something – but I am not. Perhaps the pleasure in this reification comes from the removal of any responsibility one feels one should have over one’s bodily actions within the pervasive world of interactive media.

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Abstract

This Paper feeds into the current transcultural debate surrounding tensions between the construction of immersive technologies within westernised paradigms. In the construction of immersive spaces, tech companies have unconsciously subjugated other cultural frameworks and perspectives. With this paper I intend to examine some of the contextual reason for this subjugation. This was a performative essay, drawing concepts from Safiya Umoja Noble, Henri Lefebvre and Afrofuturism. Safiya Umoja Noble's term 'technological redlining' succinctly articulate this subjugation in her book 'Algorithms of Oppression' where she says that 'the power of algorithms in the age of neoliberalism and the ways those digital decisions reinforce oppressive social relationships and enact new modes of racial profiling, which I have termed technological redlining. By making visible the ways that capital, race, and gender are factors in creating unequal conditions, I am bringing light to various forms of technological redlining that are on the rise. (Noble 2018: 01) These assumptions are systematic of what Jean-Paul Sartre referred to in the last century as Neocolonialism (Sartre 2001: 2). Political systems intentionally subjugating other cultural narratives, in order to impose colonial paradigms of social activity. The point is that these are still the dominant perspectives controlling global narratives and producing representations of space. Neocolonialism can be described as the subtle propagation of socio-economic and political activity by former colonial rulers aimed at reinforcing capitalism, neo-liberal globalization. (Taiwo; Accessed 02/05/19) Umoja Noble highlights a key challenge to address this balance, which is in

the construction of any digitised decision-making platform, the key point is to understand that all initial mathematical formulations that drive automated decision-making are made by human beings who exist in a specific socio-cultural context.

Keywords: Transcultural; immersive; paradigms; algorithms; neocolonialism;

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SUBJUGATING OTHER CULTURAL NARRATIVES IN THE CONSTRUCTION OF IMMERSIVE ENVIRONMENTS

Technological Redlining

Do not beg to try and seek reason from people who burnt down your house after looting its contents and are now accusing you of being homeless and underdeveloped.

I wrote the sentence above in the style of an African proverb, marking a change in an intellectual strategy as we try to book a seat at the global table of political manifestation. As we Africans wake up around the world, we are increasingly creating our own table, in order to redefine and reclaim our cultural birth-rights. This Article feeds into the current transcultural debates surrounding the tensions between cultural constructions and immersive spaces using, decision-making technologies within the culture industry, currently underpinned by westernised neo-colonial paradigms. The point being, in the devised construction of various digitally immersive spaces, tech companies have unconsciously subjugated alternative aesthetic and political perceptions, with regards to other cultural frameworks and perspectives. This has the effect of Africans from the continent and the diaspora prioritizing perspective of ourselves viewed from westernised discourses; which has never successfully unpacked its inherently prejudicial assumptions. This can be seen in the algorithms behind search engines like Google, Safiya Umoja Noble's term 'technological redlining' succinctly articulate this subjugation in her book 'Algorithms of Oppression: How Search Engines Reinforce Racism' where she says

This book is about the power of algorithms in the age of neoliberalism and the ways those digital decisions reinforce oppressive social relationships and enact new modes of racial profiling, which I have termed technological redlining. By making visible the ways that capital, race, and gender are factors in

creating unequal conditions, I am bringing light to various forms of technological redlining that are on the rise. (Noble 2018: 1)

I would like to declare, my opposition to the concept concerning race as a way to define differences in human beings. The concept of race, is an illusion that seeks to replace the concept of culture and heritage as ways to articulate differences in humanity. A difference in skin pigment does not indicate a difference in race. The word race is divisive, as it suggests that there are separate branches of humans who are running to win the prize of being the quintessential representation of an advanced human being. In this obfuscated narrative, westernised ideas of the contemporary Avant Garde, associated with white Europeans, will be the perceived winner, while all the other branches losers, destined to be defined by a neo-colonial hegemony. The fact that all humans were and are originally African, is a genetic fact. The human diaspora expanded around the world at different times, not because of an existential 'race', but due to its inherent nature for exploration and adaptation. The concept of race provided a convenient reason for the subjugation of certain groups and the power of 'manifest destiny' for others as seen in the apparent rise in white nationalism within Europe and North America.

These assumptions are systematic of what Jean-Paul Sartre referred to in the last century as Neo-colonialism mentioned above (Sartre 2001). The point is that these political systems were intentionally subjugating other cultural narratives, in order to double down on their previous colonial paradigms; cementing their values of lived space and social activity in post-colonial countries after independence.

Currently, they are still the dominant values that underpin independent post-colonial nations and their key institutions; the Neo-colonialist, still control present global narratives of social practice and their perceived value. The principles within the coloniser's tool box, of the rule of law, democracy, freedom and liberalism, underpinned by the emergence of the key institutions, were instituted during the age of Reason or simply put 'the Enlightenment'. These principles were not meant to include women, enslaved or colonized people. As Yoruba man born in Britain, I would have been seen as property to be worked, bought and sold during the enlightenment period. Therefore, these noble values of democracy, freedom and liberty, would have not applied to me. I would not have had any human rights because apparently, we lost that right in this fabricated race to be an advanced human. There is still a measure of subconscious bias in the DNA of these institutions that feed the assumption and perception about the political 'other'; those who are different from the middle- and upper-class white male. Neo-colonialism or new colonialism then, is a process of power concerning the continued influence the former colonial master has over their former colonies socio-economic activity and development. Having burnt down our houses, they used the political device of 'aid' to re-enforce our position as victims and losers in the eyes of the world, while they display our stolen artefacts in trophy cabinets called museums re-enforcing their narrative of superiority.

Neo-colonialism can be described as the subtle propagation of socio-economic and political activity by former colonial rulers aimed at reinforcing capitalism, neo-liberal globalization, and cultural subjugation of their former colonies. (Taiwo 2019)

It is no wonder that real diversity, regarding cultural difference, is under threat; when it is the hegemonic overlords that determine the criteria for global decision making. Acceptance is only assumed, when we have reframed and abandoned our ancestral frames of spatial

practice; when we accept that their priorities will always put us at the back of the bus. Safiya Umoja Noble highlights a key challenge when trying to address the prejudice with regards to the criteria for selecting search results, which is that, in the construction of any digitised algorithmic decision-making platform, the key point is to understand that all initial mathematical formulations that drive automated decision-making are made by human beings who exist in a specific socio-cultural context. If the enlightenment assumptions, which abjected and ignored the rights of the 'other' and their ancestral frames, are still in-place as a global norm, then there will always be subconscious bias. According to Noble:

While we often think of terms such as "big data" and "algorithms" as being benign, neutral, all objective, they are anything but. The people who make these decisions hold all types of values, many of which openly promotes racism, sexism, and false notions of meritocracy, which is well documented in studies of Silicon Valley and other tech corridors. (2018: 1)

The conclusion at this point, is that the current international neo-liberal frame for global development, concerning digital algorithms, has emerged from an age of reason that was not designed for women, enslaved or colonised people. Even with the best attempts to adjust and modify these systems, the accommodation of successful protests from the emancipation of women, enslaved people, civil rights and the post-colonial aftermath of de-colonisation, has meant that new algorithms will still harbour the residue of inherent prejudice.

An African Production of Space

These neoliberalist assumptions, underpinned by Western Enlightenment traditions, have been responsible for the production of the immersive spaces in most cityscape environment around the world architecturally and digitally. Henri Lefebvre's book *The Production of*

Space (Lefebvre 1994), challenges out dated assumption surrounding 'space'; re-evaluating, with particular reference to the State, the role the 'individual' and 'society' has in the construction of space. He philosophically and technically deconstructs the Western Enlightenment traditions in the light of contemporary thought, which no longer separates the production of 'lived spaces' from political economy and cultural practice. He argues that social space is a social product, which by its nature is intertextual. There are three main definitions to his theory;

Spatial practice, Representations of space and Representational spaces.

Briefly then; Spatial practice is linked to the daily routines within society. Representations of space identifies the symbiotic correlation between what is lived and what is perceived with what is conceived. Representational spaces occur as a result of cultural and sub-cultural groups seeking to symbolise their shared social life (Lefebvre 1994).

Spatial practice

This can be seen as an activity that is closely linked to the daily routines of percipients and the social networks they create within their society. The key focus is continuity with a certain amount of cohesion. The use of the term percipient to define an individual in this context, is important here as the assumption is, percipients will be familiar with the practice and its location, by the repetition of their activity.

Representations of space

This identifies the symbiotic correlation between what is lived and perceived with what is conceived (Lefebvre 1994). This is where we make models that articulate the architectonics of a social environment. This is where we impose a particular knowledge frame in order to organise

the construction of space. According to Lefebvre when we create representations of space, we do this through the conceptualised arts of a "scientist, planners, urbanist, technocratic subdividers and social engineers." (1994: 38)

Representational spaces

This occurs as a result of cultural and sub-cultural groups seeking to symbolise their shared social life. As a result, they will embody complex symbolisms as a way to represent identity and belonging. Although, with certain exceptions, these tend towards more or less coherent systems of non-verbal symbols and signs.

Space as directly lived through its associated images and symbols, and hence the space of "inhabitants" and "users". (Lefebvre 1994: 39)

How we, as Africans in Africa and the African diaspora, perceive and conceive of our lived spaces, has in the last century been framed by either the Abrahamic religions, Capitalism or Communism; all of which, do not adequately represent the plethora of Afrocentric metaphysics that governed pre-colonial societies in Sub-Saharan Africa. This makes African conceptions of lived spaces essentially invisible, as we struggle to imagine a fictitious and literal future. Resistance to this subjugation, can be seen with rise of Afro-futurism, which was and is a reaction to the lack of an African future in main-stream science fiction. Before Marvel's Black Panther, in all the major science fiction movies, Africa, as a continent, did not really exist in any of these futures. Our knowledge has been successfully banished to the prisons of western museums, forever disconnected from its origins and prevented from creating its own version of spatial practice in the future. Africans that do exist in these futures, have been successfully assimilated into a future conception that reinforces a Westernised hegemony. Their presence, in these futures, is as a tolerated token intended to maintain racial diversity, suggesting that only enculturated Africans can exist in these futures. It is important, at this juncture to

point out and define the origins of the term Afrofuturism, which was first coined by author Mark Dery. It appeared in his essay written in 1993, 'Black to the Future', he wrote about his observation of the African American's dilemma and difficulty of drawing on a past in order to project a future where African Americans could control the story of their roots and becoming. He suggests that African American are, in a sense descended from alien abductees and that their experience already embodied a sci-fi nightmare. According to Dery:

The notion of Afrofuturism gives rise to a troubling antinomy: Can a community whose past has been deliberately rubbed out, and whose energies have subsequently been consumed by the search for legible traces of its history imagine possible futures? (1994: 180)

Afrofuturism has since gained in significance as a cultural aesthetic, philosophy of science, and philosophy of history that explores the developing intersection of the cultures inherent in Africa and the African Diaspora with contemporary technology. It combines elements of: Science fiction, historical fiction, fantasy, Afrocentrism and magic realism with non-Western cosmologies in order to critique present-day dilemmas of African people from Africa and the African Diaspora by interrogating and re-examining historical events. However, these ideas and aspirations can be detected as early as the 1920s in the Harlem renaissance, with writers like Marcus Garvey and W. E. B. Du Bois who argued for a new ethnic consciousness by actively researching and expressing ethnic pride. To conclude at this point, the models that articulates the architectonics of Westernised social environments, imposed particular knowledge frames in order to organise the construction and production of space; which was never initially designed for women, enslaved and colonised people to be free. It is no wonder that racial profiling persists as unconscious bias in our institutions. They are embedded in the DNA of its construction during Europe's age of reason.

Racial profiling

The question, whether racial profiling is another way of saying racial stereotyping, reveals a complex dilemma when trying to prevent institutional racism. If algorithms are facilitating decisions based on cultural profiling, how do we mitigate against this unconscious bias, which will only deepen the bias in the decision-making process with potentially disastrous results. In the past the 'other' would have to contend with librarians and teachers who assume a euro-centric perspective with regards to knowledge, but now with algorithms using big data, these perspectives have been compounded; as Noble has intimated below, prejudicial algorithms are set to be the norm:

What I discovered through my research is that algorithms are now doing the curatorial work that human beings like librarians or teachers used to do. When I initially came up with the title, back in 2012, the word 'algorithm' wasn't used the way it's used today. It wasn't in the headlines; journalists weren't really talking about algorithms. Fast forward to 2018, and my mother-in-law is talking about algorithms. Now everybody understands the word. (2019)

This has: Biological, psychological, sociological, pedagogical and ergonomic implications concerning the role of human effort in the formation and implementation of smart digitised city environments; which, has radically dislocated and disembodied percipients from any ecological imperatives that may have become more prescient, if viewed from different cultural narratives with reference to the 'other'. The voice of the 'other', so eloquently expressed by Greta Thunberg's campaign for drastic action, in trying an overt a climate disaster; to rebel against our current levels of extinction, concerning bio-diversity and I would add, ethnic-diversity. Issues to do with embodied knowledge and lived space underpins how immersive spaces construct parameters that effect the expression of: Narratives, choices, ethical

concerns, racial profiling, the differently abled and gender. It affects how the telling of untold cultural narratives, concerning the construction of physical and virtual environments, can alter the paradigms and pretext underpinning perspectives of being and becoming in these new social contexts. New simulations technologies are colonizing our lived spaces, promising a form of digital utopia, where we can change the illusion of reality. The cultural expectations of VR and AR, regarding the purchase of an apparent utopian event, experienced in the moment, conflicts paradoxically with the cultural ideologies of capitalism. By this I mean, it has the desire to create dissatisfaction, shortly after the moment of experiencing a product, in order to fuel the need for more consumption; therefore, maximising the continued profit margins of companies that operate within these dominant paradigms of rampant consumerism.

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Abstract

The paper advocates the importance of reintroducing the idea of ‘contradiction’ into contemporary cultural analyses of digital media. In particular, it takes YouTube videos of old Vine clips as case to showcase the value of joining the conceptual lens of post-humanist theory with the perspective of ethnographic inquiry. It outlines the messy reality in which the objective appearance the videos and YouTube’s algorithms create is coupled to the subjective purpose of user’s desire to experience and relate to the world through the style and format of Vine clips, documenting absurd, funny, and comedic everyday realities. Herein the paper critiques overly holistic diagnoses of an ‘always on’ culture and instead emphasises the importance of embracing the nuances and subtleties that rest in contextual particularity. It closes with a call for the humanities and social sciences to join resources in order to create tangible representations of this contradictory and messy reality of digital media.

Keywords: affect; digital culture; digital ethnography; poetics of platforms

HOW TO APPROACH THE COUPLING OF OBJECTIVE APPEARANCES AND SUBJECTIVE PURPOSES?

Taking digital culture seriously

The argument I want to advance in this paper is simple. If we are to really understand the powers digital media wield, we need to scrutinize more thoughtfully the process in which they do so. Questions of how today’s media environments are attached to and negotiated by ‘the people’ seldom receive focal attention in debates. Digital devices are strongly present in daily life, fueling large-scale operations of datafying human behaviour and creating targetable ‘data doubles’. This justifies skepticism and critique. To some degree digital technologies have rendered people more prone to affective control. Users are simultaneously human and more-than human, remain present in a database elsewhere (Clough 2018). Digital technologies increasingly take an infrastructural role in social life. Doing so they render possible a future in which they function as the groundworks of a new, colonial-like social order taking shape (Couldry and Mejjias 2019).

However, cultural critic Joanne McNeil (2020) makes an important comment in her recent book ‘Lurking’. She argues that the stories of ordinary users today ever so less sit at the heart of such discussions. Instead, technology and its architects face public scrutiny. While they should, the view nonetheless appears incomplete. Within the push towards accountability and social responsibility one must keep in mind that culture is a contradictory process. As Stuart Hall wrote: “The danger arises because we tend to think of cultural forms as whole and coherent: either wholly corrupt or wholly authentic. Whereas, they are deeply contradictory, they play on contractions, especially when they function in the domain of the popular.” (1981: 233). Recent empirical research on the affective experiences of digital environments underlines this point. Feelings of discomfort over the lack of control can as much be observed characterising

encounters with digital environments as do feelings of joy over momentary experiences of emancipation and participation (see e.g. Bucher 2017 or Kennedy 2018).

Put differently, the precondition to be affected, to be touched and moved, and likewise to evoke such sensation, is embodiment. Post-humanist theorisations of digital technology, such as those of Kathrine Hayles (1999) or Mark Hansen (2000), have prominently shown how this embodied and material facet of digital media has historically been ill-addressed. Emphasising that digital media have an affective presence, that they materialise an energy capable of setting into motion thoughts, feelings, and actions, has herein been vital. The work of Hansen (2014) specifically has provided a rich terminology addressing the expanded ‘worldly sensibility’ digital media broker today. However, the work of Hansen, and others, remains lacking on other levels.

Hansen (2016) argues that it is important to understand the coupling of objective appearances and subjective purposes. That is the question of how media and their presence come to be interlinked with rhythms of social life, allowing the former to have an impact on how the latter unfolds. It is this question on the ‘affective economy’, to borrow a term from Sara Ahmed (2004), which Hansen, like others, answers by reproducing narratives of an ‘always on’ culture. As Hansen writes: “contemporary capitalist industries are able to bypass consciousness - and thus to control individual behaviour - precisely (and solely) because of their capacity to exploit the massive acceleration in the operability of culture” (Hansen 2014: 189). In this view the presence of digital media is seen as smooth and continuous force field,

rendering ineffective a 'temporal gap' between occasions of affective experiences as potential site of negotiation and resistance. Charting such holistic views, 'the people' become of less analytical importance compared to 'the media' and their sustained presence.

Such diagnoses are theoretically sophisticated. However, they need to be approached with doubt for do they lack empirical nuance. After all, the early work of Hayles (1999) emphasised not only that digital media are material and embodied but also that this embodiment is always contextual, that means specific and negotiable. If we are to take seriously digital culture, the ways in which it expands not only ways of connecting to one another but also sensory contact to worldly becoming more generally, we need to be more thoughtful on matters of process.

In order to see the possibility of life within capitalist ruins, as Anna Tsing (2015) argues, requires arts of noticing. It is such arts of noticing which allow attending to questions of power more thoughtfully. Ethnographic studies on the social uses of internet and digital technology have long advocated the importance of looking at the ways in which people actively integrate media into their daily rhythms (see e.g. Baym 2010 or Miller 2011). Combing this ethnographic view with the conceptual lens of post-humanism does, I argue, enable such arts of noticing for our present-day situation. It generates a more complete perspective on the processes in which human and technology affectively encounter each other. It creates sensibility for all those nuances and moments which contradict and conflict what is otherwise seen as smooth and continuous presence of digital media, a whole and coherent condition of life today.

'Vines that keep me alive'

Other than confronting the analytical inaccuracy that I have here gestured towards on a theoretical level, I am going to present an

empirically concrete case to illustrate the benefits and value that shifting the analytical view on digital media can offer. The case along which I want to do so is that of YouTube montages of old Vine clips. Vine was a Twitter-owned short-video platform that was founded in 2012 and ended its service in late 2016. At its peak Vine had 200 million active users and was a vibrant home of online video culture. Vines, the short-videos that could be created, shared, and consumed on the Vine app, where therein only seconds long and often documentations of absurd, funny, and comedic moments in everyday settings. Ripe of pop cultural references and remixes, Vine themselves soon turned into a talking point among youths in order to relate and makes sense of others and the world around.

Yet by now Vine appears largely forgotten. It remains a memory slowly overshadowed by the presence of TikTok, the short-video platform that has more than 800 million users and been downloaded more than 2 billion times. Despite TikTok already launching internationally in late 2017, it is only in recent times that it reached widespread popularity, and resultingly public scrutiny. Frequently the short and seemingly arbitrary videos commonly known as TikToks are discussed in a skeptical view. Some even going so far to render the app 'digital crack cocaine' (Koetsier 2020) or the ultimate time-wasting machine, holding people in a constant state of flux and distraction (Odell 2019).

Short-video contents, and their distribution in algorithmically curated content feeds, had in the time of Vine, as now in the time of TikTok, their meaning and value often put into question. Just like amateur filmmaking practices had frequently been ill-labelled as 'artless' or 'silly hobby' (Zimmermann 1995), short-video contents and their ephemeral nature contradict ideals of meaningful experience. They are what Hans Ulrich Gumbrecht (2012) once described as 'images made resistant to interpretation'. Their complexity, as Ulrik Ekman (2015) observed, rests less in their textual

depth but possibility to broker sensibility for the moments they document. Their meaning stems not from being singular textual artefacts in which deeper meanings are hidden and a wait to be deciphered. Instead, short-videos like Vines, as an assemblage, materialise a flow of sensibility one can join in on. It is this quality which post-humanist ideas such as Hansen's (2014) 'worldly sensibility' or that of 'embodied vision', not focused on interpretation but following the image's rhythm, offer a profound analytical grasp on.

When Vine 'died', in the sense of its material presence, databases and servers, shutting down, so 'died' the space capable of assembling this flow of 'worldly sensibility'. However, Vine culture, the practices and lived experiences, 'survived' this shut down ingrained into people's memory. In search for a new 'home' many Vine users thus 'migrated' to YouTube. And one practice deployed in that situation was the creation of compilation and montage videos of old Vine clips. Apart from more 'ordered' montages, for instance archiving all videos from a specific creator or personality, these videos quickly reintegrated the comedic and ironic facet central to Vine culture into the nexus of archival practice. Montages, 10 to 20 minutes of length, started functioning as containers holding Vines not for purposes of neatly archiving contents but recreating the experience of flow. Where once Vine's algorithms provided people with a seemingly endless stream of clips, users now shifted from one 10-minute YouTube montage of clips to the next.

While this practice of care in itself already underscores the significance these seemingly arbitrary clips had for people, thus contradicting their connotation as 'meaningless' and lacking depth, the way in which such montages were titled is further insightful. A popular formula for such titles is that of Vines that '... keep me alive', 'cured my depression clean', 'keep me from ending it all', or 'butter my croissant'. These titles are deictic gestures. They not only express the

significance of Vines in general, and those in the montage particularly. Rather does their ironic and comedic tone show awareness. These titles overstate the impact Vine had on people's life. They are playful appropriations showing that within that 'temporal gap' between occasions of affective experience there exists vital moments of resistance. People express awareness for their 'addictive' relation to digital media, laugh about how they could not live without it, and thus showcase the possibility to intervene and negotiate this relationship others render a wholly corrupt 'always on' culture.

Algorithmic Inaccuracies

Gathering data via YouTube's API on the likely recommendations surrounding the search query 'vines that', we can further observe the powers at work in this sphere of digital culture. Using gathered data, we can create a network map of the recommendations surrounding these typical Vine montage videos. Or, put differently, we can visualise the database creating the objective appearance that is experiencing the flow of Vines on YouTube, one 10-minute montage at a time.

At first glance, what we can see within this map is that YouTube manages to categories and cluster videos into recommendable building blocks along the lines of different genres. In the centre, for instance, we find the classical 'vines that' montages, followed closely by clusters of different music or pop culture specific Vine montages. Yet we can also see how the map, at its edges, links and directs people towards other content on the platform. Here we can for example see other compilations of 'funny moments' or home video montages, similar in style to Vines. All this suggests that YouTube is very likely efficient at keeping people in the loop, that means engaged in a more or less continuous flow of Vines and similar video clips bundled into 10-minute long videos.



Figure 1. Annotated network visualisation of the related videos network for the search query 'vines that'. Around 48.000 videos and on average 6.6 connection between them. Data was analysed using network modelling and qualitative content analysis techniques.

However, when we zoom in more closely, and look at the dynamics of the network, we can make an interesting observation. The algorithmic system of YouTube injects a logic, that of positive/negative terminology, into the cultural sphere of 'vines that' which has not existed in that cultural sphere beforehand. Videos in the most central cluster that have negative sounding terms in their titles, Topic 12 and 6 in the above figure, are less central in the network, which means less likely to be recommended, than videos in Topic 15, which have more positive sounding terms in their titles. This is an interesting observation because we have previously seen how these terms are used in ironic and comedic statements. They all are used to express videos to be of value and significance, that is videos people would be interested in watching, so to say.

This highlights two things. Firstly, it shows an inaccuracy on the algorithmic side, that of the objective appearance, questioning the narrative of algorithms being fully efficient at understanding and controlling user behaviour. Yet, secondly, it also underscores the structural imbalance in place. Even though users were, be it intentional or not, able to create this inaccuracy through their signifying practices

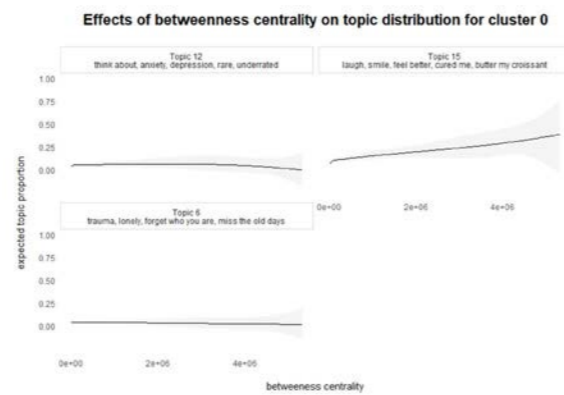


Figure 2. Results of topic model on cluster 0. Showing the betweenness centrality (likeliness for recommendation) score developing over expected distribution of topic (video with specific terms in title).

in the video titles, they nonetheless have comparably little control over the means of the database and its operation as such. While they can make the decision to watch a video or not, they have no real impact over how the objective appearance takes shape for them. Their ways of intervening in the coupling of this objective appearance to their subjective purpose of relating to other people and the world through the lens of Vines are limited. However, even if limited, it is important to note that they do exist.

Steps towards a processuality of the post-human

In sum, what the concrete exploration of the case of Vine montages on YouTube has shown is the importance of nuances and subtleties. Other than creating a smooth and continuous presence, there are cracks which substantially impact how the ontological powers of digital media should be enunciated. Combining post-humanist theory with a digital ethnographical practice has allowed to uncover different layers of the process in which the meaning of short-video contents is negotiated. It has allowed us to look at the coupling of objective appearances and subjective purposes. We were able to observe this coupling as contradictory and messy process

in which neither algorithms nor users are ever fully in control.

Further, as much as ethnography is a mode of inquiry, it is also one of writing. The poetics and politics of creating cultural representations in such descriptions and stories are likewise an integral point of reference for future reflection. In domains of digital culture this process especially extends towards modes of scholarly expression less frequent, namely those that are visual. Beyond joining resources in-between humanities and social sciences on a conceptual and methodological level I do therefore believe questions of expression to be of further importance. Taking seriously digital culture is thus not only a matter of stance and perspective but also making tangible the contradictory nature that defines its complexity and negotiates its consequences.

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Abstract

Using literary non-fiction as a writing practice, this paper explores the sensory bodily experience of immersion in virtual reality (Leavy, 2009; Lopate, 2013; Kim, 2016; Van Manen, 2016). This sensory driven literary non-fiction narrative is '... not devoid of theory' (Kim, 2016:34). Rather phenomenology is a theoretical approach which is used to inform writing practice. As such, phenomenology provides a critical tool to gain insight into the bodily, spatial and technological aspects of immersive experiences in virtual reality. By creating a literary non-fiction narrative about immersion, followed by a critical commentary this paper seeks to provide a way of discussing how technologically mediated experience can be represented through linear written form. Through using narrative to discuss immersion, the potential and limitations of writing as a way of conveying sensory bodily experience of immersion becomes explicit. Using critical reflection, the article's main findings are that the writing about immersion in virtual reality is not a '...pure construction...Rather it is a finding-through-making' (Freeman, 2016:145).

Keywords: immersion; virtual reality; literary non-fiction; phenomenology.

RADICALLY IMMERSED IN NARRATIVE: BODY, SPACE AND TECHNOLOGICALLY MEDIATED EXPERIENCE WITH VIRTUAL REALITY

Introduction

Using literary non-fiction as a writing practice, this paper explores the sensory bodily experience of immersion in virtual reality (Leavy, 2009; Lopate, 2013; Kim, 2016; Van Manen, 2016). Writing a literary non-fiction narrative is '... not devoid of theory' (Kim, 2016:34).

Rather phenomenology operates as a theoretical tool to gain insight into the bodily, spatial and technological aspects of immersive experiences in virtual reality. By creating a narrative about immersion followed by a reflective critical commentary, this paper seeks to provide a way of discussing how technologically mediated experience can be represented through linear written form. In taking this approach, the potential and limitations of writing as a way of conveying sensory bodily experience of immersion becomes explicit. Furthermore, this literary non-fiction narrative raises a series of significant questions about subjectivity, reflection and writing about immersive experience.

Surveying existing research indicates there is a wealth of studies concerning immersion and virtual reality (Perez-Marcos, Sanchez-Vives and Slater 2012; Farman, 2012; Lupton 2015; Grabarczyk and Pokropski, 2016). However, this paper aims to expand and develop existing research by offering a different approach which considers immersion and virtual reality in relation to narrative and the structuring of experience through writing.

Becoming immersed

Her right foot hovers over a ledge, she feels like a tightrope walker suspended between two tall buildings. Swiveling around, she sees a monochrome cityscape. Where is this place, she wonders? She sways over the ledge but freezes when she sees a sheer drop to ground level. She jerks and stumbles backwards. Her

stomach knots. The ledge beneath her feet feels weightless. Where are the smells of the city, traffic fumes, street food or even sweaty people crammed together? Feeling restless, she removes her Oculus Rift virtual reality headset.

Reading the plaque beside her, Beth learns that Fabio Giampietro painted the monochrome cityscape of Hyperplanes of Simultaneity and this was transformed into digital code by Alesso de Vecchi. After interacting with Hyperplanes of Simultaneity she wanted to find ways of expressing the terror she felt whilst appearing to be on the ledge of a skyscraper. How could she convey this sensory experience and provide insight for other researchers? Beth thought that by writing about interacting with virtual reality we can understand more about how we represent immersive experience through language.

Soon after interacting with Hyperplanes, Beth saw an online post about a new virtual reality research group called The Radical Immersives. Their next meeting would be held at a local university, so she decided to go along. At the start of the meeting, David the Chair, asked everyone to introduce themselves and say a few words about their research. Claire introduced herself as a sociologist and said virtual reality seemed nonsensical because online and offline experiences intertwine. Similarly, James dismissed oppositional approaches to the virtual and the real by focusing his attention on the materiality of virtual reality. Whilst Dimitrij said he was interested in using virtual reality to create multi-faceted immersive news stories. Then Sondra spoke about how somatic approaches to movement could provide insight into immersive experiences with virtual reality. Finally, David introduced himself as a cultural anthropologist

and warned about disconnecting from the underlying interdependence of the more-than-human world through immersion in computer-generated worlds.

Sensory Experience

After sketching some ideas down in her notebook, Beth decided to discuss them with other members of the Radical Immersives at their next meeting. The next meeting began with a discussion about sensory experience and interaction with virtual reality. Neuroscientist Mahmood said that physical sensations can be explained as patterns of neural activity, chemical molecules and brain receptors. Yet Beth wondered if taking an objective scientific stance to immersion through analysing neural activity and chemical receptors could fully explain her subjective sensory experience of Hyperplanes of Simultaneity. Mahmood's insights led to further discussion about the dominance of scientific knowledge and distrust of sensory experience in western culture, especially Christian doctrines concerning the imperfect and impure body. Beth also recalled how seventeenth century philosopher Rene Descartes claimed the mind was the ultimate foundation of consciousness and knowledge of the world whereas our bodily senses were untrustworthy. Talking about Descartes and sensory experience reminded her of popular representations of virtual reality from the 1980s onwards of transcending the limitations of the physical body through immersion. But Beth thought these representations overlook the centrality of bodily experiences with virtual reality. So Beth decided to take a different approach by writing about the sensory, bodily experience of immersion in virtual reality.

But whilst speaking about her interest in writing narratives about immersion in virtual reality, Beth was interrupted.

'Academic research does not just produce imaginative and entertaining stories.' said Claire

'Oh' Beth said whilst trying to figure out where the discussion was headed.

'Academic disciplines such as sociology draw on theories and structured methods of data collection to provide powerful explanations about social structures and functions.' Claire exclaimed.

Whilst agreeing with some of Claire's points, Beth knew conventional social science research involving data collection and analysis was not something she wanted to pursue. Instead, Beth was curious about how writing narratives could evoke the sensory experience of immersion in virtual reality.

Writing challenges

Over the next few days Beth was buzzing with ideas about immersion in virtual reality. But she wondered how to transpose sensory experience into linear written form. Larger questions swirled in her mind as she realised the challenges involved in writing about any form of sensory experience. Even conducting interviews and using research tools such as presence questionnaires relied on recalling past experiences and transposing them into language. In the past she had written about virtual reality from a theoretical and analytical perspective, creating arguments that were based on theories and debates with other scholars. Now Beth wanted to pursue writing in other ways, so she called Max, one of the members of The Radical Immersives and told him about her writing anxieties.

Max agreed to meet Beth at a local cafe to discuss her ideas. In between sips of coffee, Max told her his work was grounded in phenomenology as a philosophical model and research practice.

Max added 'phenomenology shows how sensory experience becomes concealed by linguistic labels.'

'So how can phenomenology help me write about sensory immersion with virtual reality?' Beth asked.

Max claimed phenomenological research does not use a strict set of rules or procedures. He said scientific research operates according to principles of objectivity and impartiality, so different people can conduct the same experiment and obtain the same results. But the phenomenology of experience could not be fully explained by scientific, objective based approaches. Instead Max urged Beth to approach sensory experience through narrative, anecdote and non-literal figurative tropes such as metaphor. Max added that phenomenological writing was not simply a method of factual recording or presenting the findings of a research project, rather it was integral to the processes of making sense of our experiences.

Max gave Beth an example of how phenomenology provides insight into experience. Max said the term talk can refer to giving a sermon, lecture, a communicative experience, gossip, or a debate. The word talk refers to many different experiences and makes sense in different contexts. So they could not fully understand their conversation by simply analysing the word "talk" in isolation.

Max said, 'in a few days you may recall the factual aspects of our meeting, such as the date, time and venue. Yet the full sensory aspects of our meeting may not easily be recalled.'

Max continued 'we need to realise ...that the word talk is less important than the experience of having a talk.'

'So you mean phenomenology is a way of highlighting how the words we use to describe immersion are not the same as the actual experience of immersion.' said Beth.

'Yes' said Max.

Beth found Max's comments unsettling. In her experience, empirical research producing measurable outcomes had high esteem in academia. Wasn't phenomenological research a bit fuzzy, risky and unpredictable in comparison to empirical research?

Beth pushed through these anxieties because she was determined to move beyond her usual theoretical and methodological boundaries. A few days later at a research networking event, she discussed these ideas with Luke Adamson, a Professor of Biological Science.

'It seems to me that writing about ad hoc immersive virtual reality experiences is subjective, value-laden and narcissistic. Where is the evidence to support your discussion, where is the data?' said Professor Adamson.

Professor Adamson's remarks reminded Beth of the socio-cultural value of literary nonfiction combining actual events and experiences with literary forms such as scenes, characterisation and dialogue. For literary nonfiction was not considered as prestigious as fiction or academic, theoretically informed writing.

Beth responded to Professor Adamson's by saying that stories are intersubjective rather than just personal because they need to make sense to others. Beth added that her writing attempted to give meaning to the experience of immersion whilst also recognising this would not be a straightforward personal account. Instead, she explained that her account of immersion involved turning the self into an object of study that makes sense in a socio-cultural framework of shared understanding. Professor Adamson just looked at her, then turned and walked away.

After encountering skepticism about her writing, Beth was relieved when Mark a narrative scholar, spoke at the Radical Immersives next meeting. Mark explained that narrative truth is not the same as objective

truth claims. He said narrative truth is about deeper meaning and significance and can be evaluated on the basis of whether it is helpful and illuminating.

Coda

She reaches out, touches and feels a smooth inky black line hovering in mid-air. Then she uses her hand-held controller to paint other sinewy lines in crimson, magenta and jade and walks around them. She animates some of the lines watching them ebb and flow, adding melodious sounds to complement their movement. She even catches one of the crimson lines in her mouth, exploring the strange sensation of tasting pigment. Strange shapes appear to move through her body, cascading down her arms and legs. She finds herself radically immersed within virtual reality.

Critical reflections

As an academic researcher, I usually feel compelled by expectations to create a theoretically informed argument about immersion in virtual reality. This involves taking up a position and supporting it with plausible evidence and explication. However, this critical reflection section alternates between different voices or registers such as academic language and the writing style of literary non-fiction. I sense a compulsion to flesh out Beth's story with more academic and theoretical insights. Yet, I do not want these critical reflections start to overshadow Beth's story.

At the start of the writing process, I realised that my usual intellectual and often abstract approach did not chime with my powerful visceral experience of Hyperplanes of Simultaneity. Therefore, I decided to experiment with another approach as an attempt to evoke the sensory experience of immersion in virtual reality. Dance and movement specialist Sondra Fraleigh (2018) provided fruitful insights into somatic experiences and phenomenology. Fraleigh contends that phenomenology

as a research practice is about surprise, improvisation, the unexpected and discovery. As such, openness, fascination and curiosity became the starting point to my phenomenological exploration of immersion in virtual reality. Furthermore, Fraleigh's work showed how bodily forms of knowing which are cognitive and somatic could enlarge our understanding of immersive experiences with virtual reality. Fraleigh's (2018) questioning of the conventions of academic language also showed how theoretical and conceptual language is often distanced from feelings and bodily sensations. Heeding Fraleigh's discussions of the distancing qualities of abstract theoretical discussions, I decided to produce a literary non-fiction narrative about immersion in virtual reality.

Creativity involves a sense of mystery and taking risks into the unknown. During the writing of a literary-non-fiction narrative, I attempted to lose my familiar academic voice. Rebecca Solnit's writing on getting lost provides useful insight into the creative process. Solnit points out that the term lost stems from 'the Old Norse *los*, meaning the disbanding of an army' (2006:07). Solnit goes on to say that getting lost is a process of '... falling out of formation' (2006:07) and going beyond what you already know. Producing a literary-non-fiction narrative involved disbanding my usual way of writing and falling out of the theoretical formations and explanations that are familiar territory in academic research.

In agreement with Philip Lopate (2013) it is important to locate the sociological, economic and cultural factors surrounding the experiences which are represented through literary non-fiction. Following Lopate's advice, the context surrounding the immersive experiences represented through Beth's narrative relate to my attendance at the Leeds International Festival (LIFF) which featured the Lumen Prize for digital art. The Leeds International Festival was held at the Clarence Dock, a mixed-use site of a major conference venue, a hotel, apartments,

retail and office spaces. Hosting the Leeds International Festival showcased Clarence Dock as a postindustrial space, the site of an urban renaissance powered by digital technologies including virtual reality applications such as Hyperplanes of Simultaneity and Google's Tiltbrush.

Furthermore, the literary nonfiction narrative of Beth's immersive experience of virtual reality draws upon memories and combines actual events (visiting Leeds Dock) with fictional elements such as scenes, characters and dialogue. Writing about these experiences involved turning the self (the experiencing subject) into a fictional character Beth. During the writing process, I experimented with using different points of view as outlined by science fiction novelist Ursula Le Guin in *Steering the Craft* (2015). I found first person narration sounded overly subjective. Therefore, I decided to use third-person narration to convey Beth's viewpoint and her feelings about immersion in virtual reality. I wanted to highlight Beth's function as a character in a narrative as a literary construction. The character Beth attempts to offer a plausible account of experiencing immersion in virtual reality. Yet she offers a selective account of immersive experience, highlighting certain features of that experience rather than others. As a character in a narrative Beth also needs to be doing something to move the story along such as feeling anxious about writing, going to meetings and talking to other characters.

Narrative structure offered a way of ordering my experiences of immersion in virtual reality into a temporal sequence which is not '...necessarily in chronological order' (Kim, 2016:08). The top layer of the narrative provides details of what happens, the main characters and Beth's decisions. During the writing process, I found myself balancing exposition, detail and selection. I found there were dangers in offering too much exposition about the technical or philosophical dimensions of immersive experiences in virtual

reality because this seemed to slow down the pace of the story. Beth's experience also needed to be arranged into a plot, where one thing (or situation) leads to another. In this way, this literary non-fiction approach involved an inciting incident (Beth's fear of falling from a simulated ledge), rising action and a turning point (when she decided to take a phenomenological approach to writing and research).

Using a literary nonfictional narrative meant I could blend personal memories with research practices such as reviewing the literature about virtual reality and immersion. Adding elements to the narrative which are based on scholarly research attempts to provide wider significance to personal experiences. Moreover, referring to the work of other scholars is a strategy for preventing self-absorption and reveals wider social and cultural patterns and debates about immersion and virtual reality. Reflection also involves drawing out certain features of these experiences whilst minimising others (Schmitt, 1959; Smith, 2005).

Beth's narrative attempts to blend some academic conventions and elements of literary nonfiction. Consequently the writing process is not a '...pure construction...Rather it is a finding-through-making' (Freeman, 2016:145). For example, the narrative uses dialogue and conversational speech which are based on concepts and debates from academic texts. In this way the narrative uses characters to explore different points of view. The initial meeting of the Radical Immersives is a setting which introduces the characters and their research interests. When Beth discusses her writing anxieties with the character Max this provides an opportunity to outline methodological concerns. For the character Max refers to Max Van Manen (2016) a phenomenological researcher whose work illuminates the philosophical and practical aspects of writing about lived experience. As the main protagonist in the narrative, Beth faces obstacles such as confusion, doubt and overcomes them. Moreover, Beth's character

aims to provide insight into actual research practices.

Conclusions

As a humanities researcher I set out wanting to know more about the sensory experience of immersion in virtual reality. Surveying previous research about immersion became a backstory, the context in which the narrative operates. I found that using phenomenology as a philosophical research practice and literary non-fiction as a form of creative expression was like entering an unfamiliar place. I felt as if I was walking into an unknown terrain, so I attempted to locate signposts along the way. But I also sought to explore some ideas that were off the beaten path. Ultimately, by using an unconventional approach I took risks, exposed my vulnerability and discomfort in not knowing how to convey the sensory experience of immersion using linear written form.

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Abstract

Using the water fountain as a prime example of reductive design thinking, I critically examine how both the ideas and concepts from the Acoustic Ecology movement and the tools of mediated immersive listening are being co-opted in order to serve a neo-liberal agenda in the built environment. The result of these adoptions representing a simplistic and non-inclusive approach to the sonic in design practice. Drawing on collaborative work with acousticians, social scientists, musicians, local government and residents, I suggest ways in which we might take a more holistic approach to sound in the designed environment, thereby honouring the affective, contextual nature of sonic experience. These suggested approaches echo some of the principles of the Design Justice Network (<https://designjustice.org/>), Sound Thinking (Henriques: 2011) and traditional methodologies and strategies from group musical improvisation.

Keywords: Soundscape; Acoustic; Immersivity; Sonic; Deep Listening; Ambisonic

Introduction

Sonic experience is crucial to an ongoing and deeper understanding of the world and in terms of health and well-being there is increasing recognition of issues such as noise pollution on our health and well-being. These add to traditional discourse around the potential for sound to both enrich our experience of the built environment and also to disorientate and confuse. However, in a society dominated by the visual, the quality of our acoustic environment is treated with minority importance, and despite the ability of sound to immerse and to situate the experienter at the centre of things (Connor 2000: 10), a visual prejudice is also found both in our built environment and in many forms of popular immersive media such as Virtual Reality and Augmented Reality.

Despite architecture's visual bias, the area is not completely devoid of attention to the sonic, with large developments, in particular, devoting considerable resources to acoustic design. Acousticians and designers, drawing on concepts from the Acoustic Ecology movement, understand the importance of integrating sonic elements from the natural world into the built environment and geophonic and biophonic features are designed into the environment in many ways. These range from the ubiquitous water fountain, the go-to solution for urban noise, to piped bird song. Despite an attention to the role of sound in built spaces as being positive, such additions represent a reductive and simplistic approach that considers sound as an object rather than an event. These strategies also discount the individual affordance of a listener's experience and fail to acknowledge sonic experience as ecological, temporal and highly contextual. Acousticians, hold power when it comes to the composition of our listening experience and current practice in sonic design promotes acousticians and sound designers to a level

of expertise that I argue needs challenging and democratising. Acousticians and sound designers, working for agencies that promote "design-thinking", an inherent hierarchy exists where, as Lilly Irani powerful points out "design thinker" promises insights, new markets, and aesthetic judgment, like a divining rod leading to new markets or domains" (Irani 2018:14). This hierarchy excludes those most directly impacted by the work of design and architectural consultants and sees public engagement as a strategy to gain credibility.

Mediated immersive listening environments have long been used as a part of the design and consultation process by acousticians as a means to communicate speculative listening experiences to clients. These tools are now seeing use in public consultation as a way of communicating aspects of acoustic experience more widely. An interesting overlap has emerged between the processes commonly undertaken by sound artists and designers and acousticians. Using tools such as ambisonic and binaural recording and playback, artists, designers, and acousticians are able to give high-resolution listening experiences that create a convincing degree of presence for the listeners. Worryingly however is that these mediated listening experiences are being used to sign-off projects to stakeholders and the wider public through listening sessions and consultation exercises. Again, whilst wider engagement around listening can be seen as positive, this approach negates both the temporal and contextual nature of sonic experience and also the role of the listener to make sound and to choose which sounds are present.

Soundwashing

In many town squares in the UK such as in Peterborough where much of my research took

place, we find the go-to solution for urban planners when it comes to dealing with noise; the water fountain. The fountains in the centre of Peterborough's square are surrounded by an array of national and global retail outlets, which have sprung up in a bid to reignite the city's dwindling daytime and night-time economy. This square, though technically public, has many of the features of other privatised, interchangeable spaces, with the familiar water soundscape and array of branded eating options. This consumption of acoustic space through the privatisation of aesthetic experience can be seen as an inevitable impact of the neo-liberal program through which, not only are the conglomerate parts of our cultural experience reduced to the lowest common denominator but the perceptual space in which these operate becoming subsumed to form part of the process. Lefebvre, who in *The Production of Space* (1991) extends Marxist concepts around the commodification of leisure to the commodification of space and explains how space in the form of a commodity is standardised and measured. In contemporary listening practices, as exemplified by the fountain, it is this standard format of the water-feature, like Jonathan Sterne's MP3 (2012) or Matt Fullers standardised media object (2007), that represents the measured commodification of our acoustic space. The fountain ripped from the ecology of the natural world adds "positive" geophonic elements to the built environment but also presents possible listening barriers and importantly embodies pertinent issues in relation to contemporary listening.

The sounds created by fountains are rich in frequency range, producing white or pink noise, this noise can mask important discrete localised sounds, as well as sounds such as traffic and construction noise. As explored by Mack Hagood (2019), synthesised white noise or recorded water sounds are commonly used to mask the effects of tinnitus and to aid sleep through apps or on platforms such as YouTube. Hagood (2019) suggests this masking is a form of

suppression and emphasises the inherent power relations at play in these listening transactions. For Hagood, in co-opting the sounds of the natural world and packaging them as a media-tools we create situations whereby "orphic media fight sound with sound to pacify space for beleaguered subjects" (Hagood 2019: 7)

By treating all listeners as the same or as (Drever 2019) suggests "auraltypical", assumptions are also being made that because some people might feel positively about the sounds of water then they are welcome for everyone at all times. For some, such as those with hearing loss, features that might widen the listening affordances of the dominant social group present dis-affordances for minority groups. In *Design Justice* (2020) Sasha Costanza-Chock frames these experiences as micro-aggressions, which "reproduce the matrix of domination; reaffirm power inequalities; generate a climate of tension within organizations and communities" (2020: 44)

This top-down, one-size-fits-all approach to design exemplified by the fountain is particularly problematic in relation to the sonic. You can argue that if you find visual branding or architectural features a barrier, or distracting, you can exercise your right as a neo-liberal subject and avert your gaze. With sound, you are "in" the experience and that experience is constantly changing, not only do we all hear the world differently but our soundscape is constantly altering and will never sound the same again.

As part of the research described above, I undertook creative activities with hundreds of people in towns and cities in the East and South East of England, during these activities as well as recording and listening, we talked about the soundmarks that were important to the local environment. Hands-down favourites were water and birdsong.

From these encounters, it's easy to see how designers and developers might come to the conclusion that by adding these favourites we can synthesise an acoustically pleasing built environment. Yet, however much birdsong and water features might powerfully, phylogenetically link us to our natural world, the co-option of singular natural elements negates the other possible ecological physical, and sensorial aspects of the natural world in an attempt to placate us so we continue working and/or consuming.

One of the most useful findings during workshops with residents and other local people was that opinions over favourite and treasured sounds in response to verbal questioning and brainstorming were very different to responses in listening back to recordings made by participants during workshops. Responses to brainstorming commonly identified expected favourites; birdsong, fountains and other sounds associated with the natural world. However, when listening back to recordings, the array and variety of positive sounds was much broader and inclusive. Sounds such as bicycle wheels, trains, even air-conditioning were identified as important sonic features that gave local environments character and identity. By breaking down the distinction between expert and non-expert through sound collection and composition during these workshops, the activities pointed to a possible much more nuanced, complex and integrated participatory approach to sonic design.

Sonic Immersion in Co-Design

Sonic immersion is a major feature of sound practice and the construction of immersive listening environments is a key element of acousmatic music. In architecture, auralisation processes commonly involve the simulation of sonic environments using tools including multi-speaker setups and binaural rendering and playback. Adopting these environments through room or headphone based experiences allows developers to present a sonic snapshot

of a scene from a newly planned development or transportation project. In doing so, the stakeholder or community member is offered the illusion of choice over a future soundscape but are, I suggest being asked to become complicit actors in the bureaucracy of planning and development.

As with the application of ideas from Acoustic Ecology, the use of immersive listening tools by developers and consultants throws up important issues around the use of immersive environments in architecture, design and public consultation more generally.

As described above, listening is contextual and temporal, the recordings presented only offer a record of a particular moment in time from the perspective of the microphone, and the array of technologies involved. As such, no matter how realistic, or how high-resolution the experience rendered through the apparatus, the recording, and playback cannot hope to communicate the ecological variables at play in a real-world listening experience.

During a listening session at an acoustics firm, it was noted by an acoustician that there seemed to be a direct correlation between the resolution of a listening experience presented to developers and the amount of money they were willing to devote to acoustic design on a project. Put simply, the clearer the recording, and the more loudspeakers employed in playback, the bigger the acoustics budget. In terms of immersivity, this connection between creating presence for the listener and money is open to manipulation and exploitation. As immersive technologies become more effective at creating a detailed, real or hyper-real environment, the possibility for manipulation becomes greater. The beauty of sound design in film and theatre is the ability of sound to seduce the experiencer into suspending disbelief whereby we accept false recognitions of sound sources and as Foley demonstrates the audience is "willingly complicit in disregarding the ventriloquial act of

manipulation for which they have paid” (Lewis 2015: 104).

Another problem is that choices for the listeners are based on recordings made by assumed experts. Here, listening is treated as a largely passive, binary experience, where the expert who has access to expensive and exclusive technology, creates a theatrical experience that the listener is asked to accept without sufficient information about the processes behind the composition. As with the recording and feedback sessions, we found that when participants became involved with the compositional and playback process, much more critical responses around our sonic environment emerged. What also became apparent was that by getting away from semantic language and the statistics commonly used in consultation around sound and noise and engaging with the material of sound itself through recording, composition and musical improvisation the soundscapes created were much more inclusive, complex and varied than if we had only selected sound sources based on conversations and brainstorming.

Despite a problematising of the application of practice and ideas from Acoustic Ecology and the use of 3D listening tools and environments, it's not my intention to negate the potential of a meaningful and inclusive approach that incorporates ideas and tools from a wide range of practices. There are I believe, many ways in which practices can be brought together to explore immersive listening in order to meaningfully engage with issues around listening and to directly influence policy and decision making. For example, immersive listening spaces, instead of being used for playback of soundscapes made by designers, should be critical spaces where iterations can be experienced, mixed and problematised by those directly affected by the planning and developments. Using the rich knowledge and methodologies from sound practice, activities such as Deep Listening (Oliveros: 2005), sound walks, field-recording and musical improvisation

should be integrated at various stages of project development, not just as tokenistic add-ons. Otherwise, sound artists as is the case in other areas of the public realm will be co-opted into the regeneration process, their work being used as brokerage through which to secure permission for new planning developments. The result being that both local community and artist are disempowered and rendered impotent.

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Abstract

This paper outlines a set of conditions that constellate around the subject of Virtual Reality (VR) artworks and their relationship to museological space. These episodic notes on the subjects of *virtuality*, *curatorial design* and *submersion* indicate how the horizon for understanding VR extends beyond the cinematic image to the cinematographic installation. Informed in a direct and highly situated way by a curatorial reading of filmmaker Alejandro Iñárritu's celebrated *Carne y Arena* (2017), their synopses expand the scope for how we might engage VR artworks and their exhibitionary conditions both within their immediate museological context and further afield.

Keywords: Virtuality; Curatorial Design; Submersion

Opening

Exhibiting Virtual Reality (VR) artworks as part of situated experiences in museums and galleries is relatively uncharted territory. Informed by my curatorial research into filmmaker Alejandro Iñárritu's celebrated *Carne y Arena* (2017), this paper provides an opportunity to present a series of expanded notes in the form of short, episodic synopses that, together, indicate how the horizon for understanding VR artworks extends well beyond the cinematic image to the cinematographic installation, and further onto the exhibitionary conditions of museological space itself. By recognizing that virtual reality is experienced in real space, this critical reading – grounded by my first-hand viewing of *Carne y Arena* when it was staged at Fondazione Prada in Milan – develops upon this point, positing that the way in which the mediated experience of the VR film itself is integrated into the exhibition's scenography by its encompassing curatorial design instigates a distinctive form of audience engagement that transcends the type of subjective viewing experience that is reinforced by the optics and visual regime associated with VR. By effectively breaking the dictatorship that the frame has exerted upon the representational form of the moving image, VR has been extolled as a new paradigm for cinematic spectatorship. Existing at the intersection of Hollywood Visual FX cinematography, documentary filmmaking and immersive story-telling, *Carne y Arena* certainly exemplifies how the ground-breaking potentialities of VR as an art form owes as much to dramatization as digitization. Yet, any critical examination of *Carne y Arena*'s immersive experience should not be based solely on an interpretation of the visual and affective qualities of the simulated, virtual image. Instead, the work's viewing experience needs to be contextualized as part of a broader, expansive and unfolding set of exhibitionary conditions. As the case of *Carne y Arena* makes explicit,

the distinctive museological "framing" of the film itself is integral to activating the theatrical, choreographic and performative aspects employed by Iñárritu to achieve his stated creative aspiration of blurring the lines between 'a dream or reality composed within a frame' (Celant & Iñárritu 2017).

Synopses

The following series of brief synopses are intended to supplement my presentation at the DRHA conference in September 2019. Taken or "seen together" (from the Greek "synoptikos"), they identify a subset of exhibitionary conditions that underpin the relationships found between VR and museological space: *virtuality*, *curatorial design* and *submersion*. This *synoptic overview* – inspired in equal measure by this original etymological meaning and as a familiar means of representing surface weather systems in meteorology – uses *Carne y Arena* (as focal point) in order to trace multiple relationships that operate within the work and form (or constellate) around it. What can this exemplary artwork tell us about the correlation between VR and museums and how they function as extra-dimensional spaces in which cultural experiences are embedded? The accompanying pair of schematic illustrations are provided here as aids to visualize the work's exhibitionary conditions; in the first instance by situating *Carne y Arena* (the VR film) within the enveloping curatorial design strategy of its gallery installation [Figure 1], and secondly, by sketching out a curatorial trajectory that contextualizes *Carne y Arena* (the exhibition) within an expansive configuration of influences and references that extend (synchronously and asynchronously; retrospectively and contemporaneously) to other artworks, exhibition projects, media installations and immersive museum displays in both grounded and more speculative ways [Figure 2].

Notes on Virtuality

In the pictorial arts, the basis for achieving virtuality is rooted to the notion of *extra-dimensionality*; that being, the capacity to see, for instance, three dimensions in two, or perceive four dimensions in three. The success of images to represent “reality” is wedded to how the frame functions as a window enabling the viewer to see into another, “virtual” world in which ‘narratives, spaces and times separate from the present, which may be past or future’ are brought together (Summers 2003).

In the case of *Carne y Arena*, this form of virtual experience is the product of the spectacular quality of the real-time, Digital Effects cinema combined with location-based immersive entertainment. The narrative trajectory of the VR film itself leads the viewer through an initial stage of orientation and acclimatization to its perceptual experience: adjusting to the hazy pre-dawn darkness; gaining one’s bearings within a seemingly boundless space, before assimilating with a caravan of Latin American refugees finding their way through the desert towards an unknown fate at the US-Mexican border. The unfolding narrative sets in motion a transformational process that “moves” the viewer, literally and figuratively, from a physical to an emotional level of engagement; from spatial orientation to intra-personal identification. Having effectively established the viewer’s relationship to the scene by registering one’s position in the virtual world, both optically and psychologically, the climax of the film scenario implicates them in a tense, confrontational scenario as the group is apprehended and forcibly interrogated by a threatening band of American Border Patrol authorities. This scene elicits a more critical awareness on the part of the participant to their *moral position* in relation to the precarious situation they find themselves in.

The viewer’s consciousness of their own decision-making is amplified by Iñárritu’s treatment of

this pivotal episode as a *scenescape*: a cinematic trope drawn from game design that affords the viewer alternate vantages upon scenes and their unfolding dramaturgy (Vosmeer & Schouten 2014). By presenting a choice to remain within the boundaries of the illusory experience or to engage in a more circumspect way by choosing to step outside of the “magic circle” of the plot (even if just momentarily), the participant experiences a form of immersion that is at once deeply emotionally and spatially sentient.

The scenescape adds an important element to the repertoire of transmedia storytelling, in which different mediums convey distinctive parts of a story or provide supplementary information that when combined together form a composite, multi-faceted *storyworld* (Jenkins 2006). It is, thus, important to reiterate that the particular type of immersive viewing experience that the VR film embodies is nested within a broader, expansive and unfolding exhibition scenario. The resulting multi-sensory experience achieves a strong sense of convergence between previously separated virtual and physical realms by mapping the headset-based Cinematic VR work into a whole-body, hyper-reality platform. Even still, despite calling upon an array of advanced technologies to simulate various auditory, visual and haptic “special effects”, the *diegesis*, or sense of the world in which the filmic narrative occurs is supported in the most immediate and tactile of way by simply laying the gallery space with sand.

Ultimately, through the process of having their point-of-view unframed in such ways, the participant is moved from individual consciousness to a social conscience. Not dissimilar to how the scenescape functions with respect to the cinematic image, the curatorial design of the exhibition at large – including its inventory of media content and gallery installations, including the “arena” in which the mediated VR experience itself is situated – provides an extra-dimensional aspect to the film. It is here, on this point of overlap – where

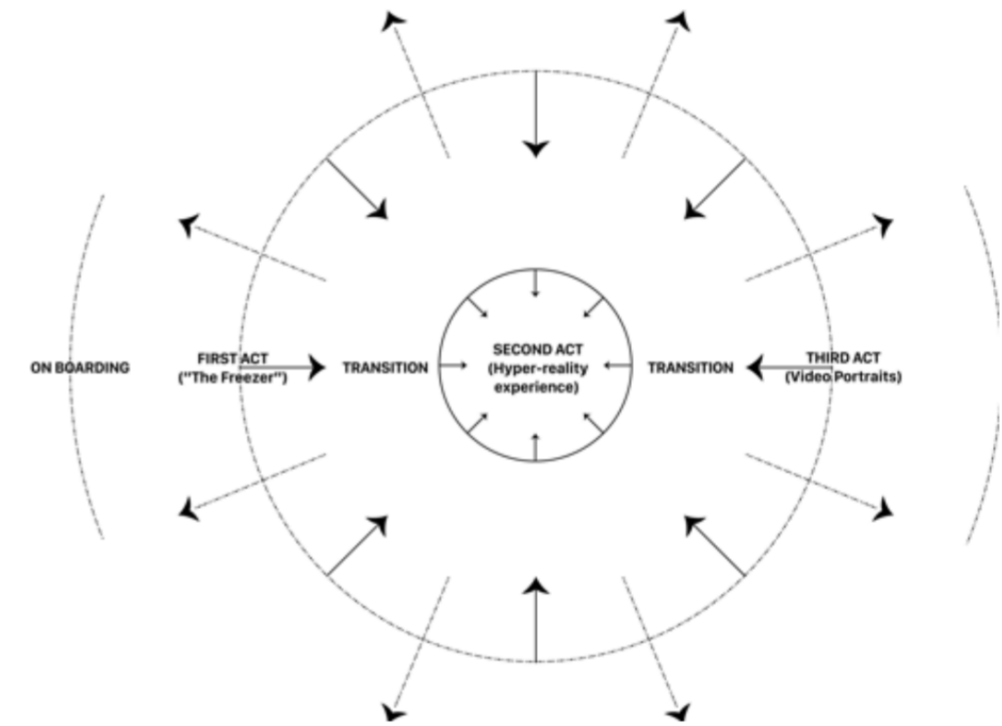


Figure 1. *Carne y Arena* (the VR film) situated within its overall curatorial design strategy. ©Vince Dziekan.

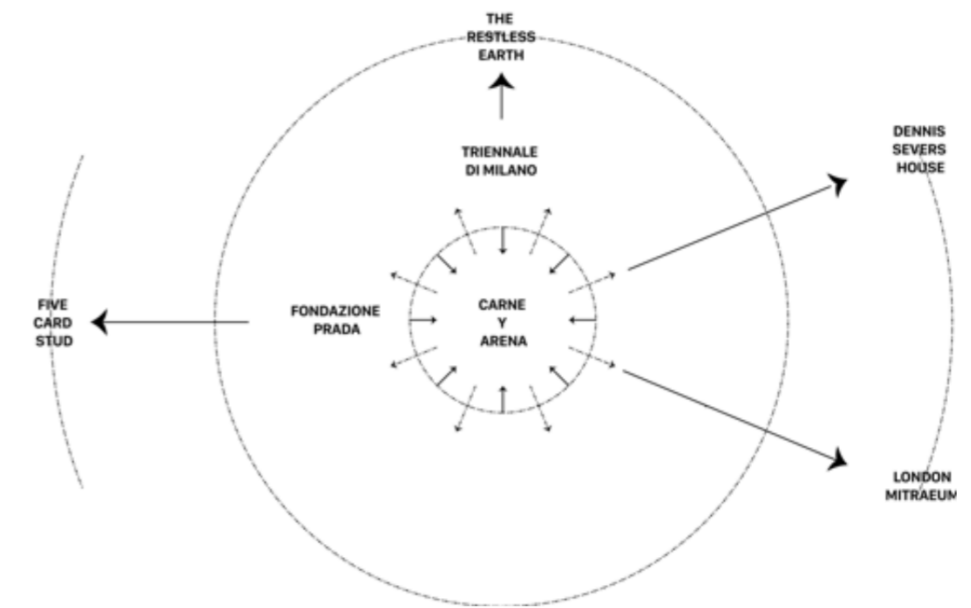


Figure 2. An indicative expanded curatorial context for *Carne y Arena* (the exhibition). ©Vince Dziekan.

episodic scenographic elements curatorially designed into the exhibition space meet their audience, and the worlds inside and outside the museum collide – that *Carne y Arena*'s political message evokes a certain “point of view”: an empathic perspective that asserts migratory movement to be a shared experience between the viewer and the subjects of the film represented as virtual avatars (Bruguera 2011).

Notes on Curatorial Design

Produced in association with Lucasfilm's Immersive Entertainment division, ILMxLAB, Legendary Entertainment and Fondazione Prada, *Carne y Arena* extends the application of digital technologies associated with computer-generated imaging from the virtual screen into the real space of the installation. By successfully calibrating the viewing experience associated with cinema to exhibition space, *curatorial design* (Dziekan 2012) supports the realization of Iñárritu's creative vision; and does so by recognizing a deceptively obvious fact: that the viewing experience of virtual images *actually* takes place in real space.

At its dramatic core, *Carne y Arena* revolves upon the confronting experience faced by a displaced group of men, women and children seeking to cross the border clandestinely from Mexico into the United States. Iñárritu has described *Carne y Arena* as a ‘semi-fictionalized ethnography’ (Iñárritu 2017) that drew upon many years of research involving interviews with immigrants from Mexico, Honduras, El Salvador and Guatemala documenting their personal border crossing experiences. This “ground truth” was reworked into the narrative basis for the screen adaptation of the VR film, as well as being factored directly into the film's production design and ultimately translating into the curatorial design of the exhibition at large.

Any interpretation of *Carne y Arena*'s immersive experience should not be delimited by the qualities of the simulated, virtual image alone.

While Iñárritu was awarded a special Oscar in recognition for “a visionary and powerful experience in storytelling”, it is worth noting that the “real-time” VR viewing experience lasts only 6 ½ minutes in duration. In this respect, it is important to acknowledge how the scenography associated the work's exhibition-based encounter effectively “nests” the VR film within an expanded and progressively unfolding experience that includes artefacts, installations and video portraits displayed across a series of inter-connected gallery spaces. As such, *exhibition space* provides a distinctive museological frame for experiencing the film itself. By establishing a *correlation* between cinema, technology and the arts, the curatorial design of *Carne y Arena* produces what curator Germano Celant describes as ‘a psychophysical unity in which, by crossing the threshold of the virtual, the human strays into the imaginary and vice versa’ (Fondazione Prada 2018). As an exercise in “world-building” in its own right, the *submersive* experience that the exhibition mobilises needs to be taken into account when interpreting the immersive qualities of the film so as not to lose sight of the fact that *Carne y Arena* achieves its full impact through dramatization, as much as digitization.

Notes on Submersion

The concept of immersion is all too easily called upon as a “short hand” way of promoting the escapist tendencies associated with VR; that of being transported vicariously to another, artificial reality. However, what becomes self-evident from the “visitor” (as distinct from “viewing”) experience associated with engaging with VR artworks in their respective exhibition settings is just how important the situatedness of the museum or gallery-based encounter is to underwriting what might more aptly be described as a *submersive* (as distinct from *immersive*) experience (Dziekan 2019). Whereas immersion perpetuates a false dichotomy between virtual and real, in contrast, submersion might be thought of as a way to hold these

modes of reality together. Whether in tension or balance, submersion encourages a means of traversing their borders (as an actualization of the virtual; or virtualization of the real).

The aesthetic impact of *Carne y Arena* is reinforced by exhibitionary conditions that not only extend the cinematic image to the cinematographic installation, but also expands the scope and resonance of the work itself within its museological context and beyond. According to renowned new media artist Rafael Lozano-Hemmer, museums are especially well suited to offer highly performative, situated “location-based experiences” for their audiences since they are already ‘*connective spaces* where disparate places and experiences actually get in touch’ (Levent et al 2014, emphases added). For their own part, Iñárritu's films are notable for portraying themes of human connection, often through complex, involving and intersecting storylines told in a non-linear structure. *Carne y Arena*'s dramatized re-enactment of real stories recounting the plight of a group of migrants and their harrowing journey to cross the US-Mexico border instigates its own distinctive form of audience engagement. Reinforced by how the *scenographic* functions as part of the multisensory hyper-reality experience nested at its core connects vision with the body in an immediate and sensate way, the work successfully fuses the sense of disorientation of being lost in the Chihuahuan desert at night with the presence of standing in the midst of a sand-filled stage located in the Prada Foundation's OMA-designed cultural complex in the post-industrial outskirts of Milan. On this point of connection – where episodic scenographic elements curatorially designed into the exhibition's meta-composition meet their audience, the worlds inside and outside the museum collide and the empathic perspective extolled by *Carne y Arena* assumes a social and political purpose.

With *Carne y Arena*, Alejandro Iñárritu redirects documentary strategies into artistic methods by constructing a reflexive narrative

that foregrounds personal memory and first-hand accounts of displacement that mark the migratory crisis being experienced variously across the globe today. By doing so, the artwork nurtures critical literacy about the ways that “truth” is produced for media consumption (Demos 2013). As a VR experience, it achieves more than a (re)creation of a reality in virtualized form. What Iñárritu succeeds in doing, expertly and with artistic sensitivity, is something more like its inverse. By dramatizing the empathetic dimension commonly associated with VR cinema, the affective and meaningful experience of it as an artwork staged inside the museum is connected with larger geo-political issues taking place in the world outside. It proves virtually impossible to separate the aesthetic impact of the work from its social context, particularly in the face of the exceedingly complex and pressing issue of forced, mass migration. Nor should it. It comes as no surprise, then, to find that the installation of *Carne y Arena* at Fondazione Prada in Milan during the summer of 2017 overlapped with Massimiliano Gioni's *The Restless Earth* at the Triennale di Milano, at a time when Europe was feeling the full repercussions of this migratory crisis (Gioni 2017). Nor for that matter when revelations of the forced separation of migrant children from their families as part of the Trump administration's border protection policies emerged when the exhibition was staged in Washington, DC the following year. Ultimately, *Carne y Arena*'s most “powerful” achievement does not rest upon rendering reality “virtual”; rather, returning to the etymological roots of the word as meaning “possessing certain virtues,” by taking into account of its own exhibitionary conditions, it instigates a dialogue that not only responds to contested authority, exclusion and inequality, but also to the media spectacle created by the culture industry that these subjects and events find themselves circulating within and co-existing with.

Closing

Developing other “ways of seeing” that extend beyond the depiction of virtual images demands an appreciation of the *actual* nature of Virtual Reality. When it comes to VR, establishing the “standpoint” in which the act of viewing itself is anchored undoes the idea of the image that is predicated by the act of looking through a frame into another space; one that is apparent, imaginary and fictive, and therefore, by definition, different to the *real* one in which we are standing. Together, the relationship between viewer and virtual image determines a social space. The palpable sense of situated connectedness that one immediately senses as part of a VR viewing experience reasserts how it is seemingly possible to ‘bring some “elsewhere” into spaces of human presence and use’ (Summers 2002). It is imperative, therefore, that in order to connect the subjective act of viewing with the social and, by extension, political space that such encounters between virtual and actual realities are located within, we consider VR a properly experiential, rather than a purely visual, medium.

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Abstract

'Documenting hybrid and participatory artworks: the role of the audience' shows that in documenting hybrid and participatory artworks it is important to capture the role of the audience in terms of its experience of the artwork and its documentation of it. The study entails a number of case studies, including Lynn Hershman Leeson's *Roberta Breitmore*, Blast Theory's *Day of the Figurines*, Amalia Ullman's *Excellences* and *Perfections*, as well as a project led by the immersive media production company Factory 42, which was developed in collaboration with the Science Museum Group, the Natural History Museum and the Almeida Theatre. The study shows that the audience is a fundamental and yet often under-documented stakeholder in hybrid art and suggests that it is crucial that its experience and documentation of the work are preserved alongside knowledge provided by other stakeholders. Only in this way could the broader history and diverse reception of a work be captured and provide crucial information about its preservation, presentation and exhibition in years to come.

Keywords: documentation; audience; hybrid and participatory art; presentation; preservation; exhibition

Hybrid and participatory art documentation

The documentation of the audience's experience of hybrid and participatory artworks, including its own documentation of the work, could play a significant role in an artwork's preservation and is likely to be invaluable in determining crucial knowledge that could affect potential future presentations and exhibitions. This field, of growing importance in performance and digital art studies as well as in museum preservation, is beginning to attract the sustained attention of researchers in academia and in the museum sector. In academia, the field has recently featured in a number of studies in performance (Sant 2017), digital art (Rinehart and Ippolito 2014, Dekker 2018) and in the exhibition context (Giannachi and Westerman 2017). Of these studies, some focused specifically on the role of oral history and oral culture (Roms 2008, Muller 2008), while others looked into ethnographic and ethnomethodological methods (Giannachi and Benford 2011). Most of these studies were published in the last twenty years, which means that we know less about how audiences responded to early performance works than we do know about their experience of more recent works.

In the museum context, one of the earliest projects considering artworks as dynamic rather than static was the *Inside Installations* (2004-7) project, developed as part of the International Network for the Conservation of Contemporary Art (INCCA). The research group produced a number of best practice guidelines examining how installation art can be safeguarded and presented for future generations. An information architecture was recommended that aimed to record the evolution of artworks, in particular installations. As Gaby Wijers, director of LIMA, indicated in her interview to Jonah Westerman in *Histories of Performance Documentation*, *Inside*

Installation emphasised 'how to document participation and interactivity' (in Giannachi and Westerman 2018: 66-71). Because of this, re-use and reinterpretation became an increasingly important topic of research in the context of hybrid and participatory art preservation. Thus, 'Over time', Wijers noted, 'we started to see the work and the documentation as one thing. One could say that the work is the core and the rest is a shell around it. This means that they are always connected'. (Ibid.) This identification of the work with its documentation is crucial. As the audience is often part of the documentation, and on occasion also the creator of the documentation, this raises interesting questions about their role in the preservation and future presentation and exhibition of a work.

The Variable Media Concept was developed by Jon Ippolito (1998), who at the time was an associate curator at the Guggenheim. The research led to what is known as the Variable Media Initiative, a network of cultural heritage organisations dedicated to the research of new media art preservation. The paradigm emerged from Guggenheim's research into the preservation of conceptual, minimalist and video art. The Variable Media Network was one of the products of this initiative. Its main findings focused on the description of works through their behaviours (e.g. installed, duplicated) as well as a set of tools known as the Variable Media Questionnaire and the Media Art Notation System. The framework underpinning the questionnaire recognised that contextual information needs to form part of documentation to indicate, for example, variations among multiple versions of a work and capture medium-independent behaviours of such works. Subsequently the Guggenheim's conservation department developed an iteration report (2012) which took into account the public

reception of the iteration of the work and visitor feedback, something now done also by other museums, such as the Met for example, to capture materials that may be pertinent to a specific exhibition. This crucial shift in documentation, marked not only the importance of documenting iterations of a work but also the focus on behaviours rather than materials, aesthetic, or artist intention, which formed the core of conventional museum documentation.

Capturing unstable media was a research summary published by Sandra Fauconier and Rens Frommé from V2_ in 2003. Crucially, *Capturing Unstable Media V2_* highlighted the differences between created and collected documents and noted the importance of documenting user interaction not only through metadata but also bespoke documentations of the user experience complemented by interviews and recordings. This constitutes a conceptual model for the description of works that recognised the role of collaboration and distributed authorship. The model included an analysis of audiences and, crucially, distinguished three phases in the development of a work that require documentation: the research phase; the development phase; and the implementation phase (Dekker et al 2010), expanding the idea of documentation to include not only reception but also what occurred during the creative and research phases of a work, thus addressing also what the terms 'artist' and 'audience' might mean in these different contexts.

Crucial in this contest is the work of V2 and Annet Dekker in particular who pointed out that documentation can be seen a process ('a tool for making decisions about the nature of the work'), a form of presentation ('the material that is made [by artists] to explain and communicate their work') and a method for re-creation (Dekker 2018: 14, 41, 42). Dekker also identified a series of documentation types, i.e. for publicity and presentation, for reconstruction or preservation, for describing processual changes

in the appearance of a work, for developing an aesthetical and/or a historical "framework" or reference, for educational purposes, for capturing audience experiences, for capturing the creative or working process of the artist(s), and, in the context of conservation, for reconstruction and preservation (Dekker 2014: 151). This again indicates how this one term, documentation, in fact subsumes a range of practices and, increasingly, disciplines, which serve different purposes and aims.

Tate was one of the museums leading the way in the field of performance studies documentation, winning two Arts and Humanities Research Council projects in fairly rapid succession. Between 2012 and 2014 the Head of Collection Care Research Pip Laurensen led, with Vivian van Saaze, *Collecting the Performative*, a research network that examined emerging practice for collecting and conserving performance-based art, looking at dance, theatre, and activism. The network created The Live List which provides prompts for those thinking about acquiring or displaying live works. The list recommends that artists are asked to provide a description of the work but specified 'for someone who has never seen it before', suggesting also that the 'basic parameters' of a work ('duration, space, number and nature of performers, variability') should be captured in this process alongside knowledge about how many forms the work exists in; whether the work evolves; whether it ought to be repeated; what the context is; how the work sits in the collection; whether a work is participatory; alongside questions about production, interpretation and audience (The Live List). These changes in the sector reflect important research in the field. Crucially, Annet Dekker, Gaby Wijers and Vivian van Saaze suggested in their 'The Art of Documentation' (2010) that with the arrival of performance, as well as video or digital works, a shift occurred in museum documentation whereby museums started to address the fact that documentation is a subjective process whose selection criteria are of 'great importance' (Dekker et al 2010). This

indicates that the cohabitation of multiple forms of documentation may prove to have significant value. As Lizzie Muller noted, media artworks challenge conventional documentation models (in Jones and Muller 2008: 418) because they require a strong focus on the user experience (Muller and Jones 2008: 8-9). For Jones and Muller, then documentation needs to reflect both the intention of the artist and the point of view of the audience, which means that it may be important to document 'a dialogue between the ideal, conceptual existence of the work and its actual manifestation through different iterations and exhibitions in the real world' (Jones and Muller 2008: 418).

These important findings in performance, digital art and new media documentation reveal that artworks and their documentations often tend to coincide over time; that documentations can lead to the creation of new iterations of a work; that it is important to capture these various iterations of a work, and include the audience reception of the work in the documentation; that audiences should be documented during the research, the development and the implementation phases of a work; that the context of each iteration of a work is crucial for its preservation; and that the cohabitation of different forms of documentation carried out by different parties for different reasons may add epistemic value to what we know about a work. These findings show that the epistemic qualities of a work, by which I mean what we know about a work from a range of stakeholders, are heavily reliant, especially for preservation, presentation and exhibition, on the comprehensiveness of its documentation. Therefore, the more complex the documentation, in terms of disciplines and perspectives involved, the deeper our ability to interpret a given work over time.

Challenges in hybrid and participatory art documentation

To understand the role of the audience in hybrid and participatory art documentation,

I will start by looking at the audience's role in Lynn Hershman Leeson's *Roberta Breitmore*, Blast Theory's *Day of the Figurines* and Amalia Ulman's *Excellences and Perfections*, which capture the complexity of the audience's position in a performance, a massively multiplayer game, and a social media event and so well elucidate the challenges in documenting the audience in these fields. I will then use my findings to discuss the documentation of a project led by the immersive media production company Factory 42 so as to show the importance of capturing the audience experience in other kinds of museum-based installation works.

Lynn Hershman Leeson's Roberta Breitmore

One of Lynn Hershman Leeson's best known works, *Roberta Breitmore* (1972-8) saw the artist embracing the role of the fictitious persona of Roberta Breitmore for a period of six years. During this time, Roberta carried out a series of actions which involved engaging with others: she checked into a hotel, got a check-book, advertised for a roommate, met a psychiatrist, encountered men (see Figure 1), etc. Using photography and moving image, as well as a graphic novel developed with Spain Rodriguez, Hershman Leeson captured these moments to create a set of documents that were subsequently re-formed, often through collage including text and painting, into individual artworks. These documents, originally conceived of as a testimony to the occurrence of the performance of *Roberta Breitmore*, together with a new set of documents produced in more recent times, became both part of, and the totality of *Roberta Breitmore*.

In the latter part of her lifetime, Hershman Leeson engaged three women, including the art historian Kristine Stiles, to act as Roberta. In 1978, an exhibition of Roberta's artefacts entitled *Lynn Hershman Is Not Roberta Breitmore/Roberta Breitmore Is Not Lynn Hershman* was presented at the M.H. de Young Memorial Museum in San Francisco during which a Roberta look-alike contest was run that led to an additional



Figure 1. Roberta meets Irwin for the first time in Union Square Park (1975). Photo courtesy of Lynn Hershman Leeson.

multiplication of Robertas accompanied by a further expansion of documents. Almost twenty years after being exorcised at the Palazzo dei Diamanti in Ferrara in 1978, Roberta was re-mediated as the telerobotic doll *CyberRoberta* (1995-8), who was dressed identically to Roberta, and had a fictional persona that was, as in Hershman Leeson's words, 'designated as an updated Roberta' who not only navigated the internet, but was in herself a creature of the internet, a 'cyberbeing' (1996: 336). Additionally, Roberta appeared as a bot in the Second Life remake of Lynn Hershman Leeson's *The Dante Hotel* (1973), called *Life to the Second Power or Life Squared* (2007-). This work, created in collaboration with the Stanford Humanities Lab, turned a number of documents in the Hershman Leeson archive at Stanford University into a mixed reality experience during which visitors could explore reproductions of fragments of the archive under Roberta's guidance in Second Life.

This complex work illustrates how documents that were originally produced to evidence the performance of *Roberta Breitmöre* were not only exhibited, years later, as the work itself but were also used to produce new works. In this sense, *Roberta Breitmöre* illustrates the importance of capturing the life span of a work, its original performance, as well as its audience's responses to its re-enactments and re-mediations over time. While the audience is variously implicated



Figure 4. Documentation of Blast Theory's Day of the Figurines. Photo courtesy of Mauricio Capra.

in a number of the iterations of the work, there are not many documents, except those produced by Hershman Leeson, that capture its engagement in the original performance of *Roberta Breitmöre*. The AHRC-funded Performing Presence Project (2006-9), which worked with the Stanford Humanities Lab on *Life to the Second Power*, systematically documented the audience during the research and development of the work in Second Life (see Figures 2 and 3; and also Giannachi, Kaye and Shanks 2012; Giannachi and Kaye 2011). This documentation, including the team's response to the work, the initial testing, as well as the work's reception at its exhibition at the Montreal Museum of Art and the San Francisco Museum of Art (2007), showed how in documenting the audience and in facilitating team and audience documentation, different epistemic qualities of a work can be brought to the surface. *Roberta Breitmöre* operates as a mirror to the time it is shown (or re-mediated in) and by analysing its different iterations and its respective audiences alongside each other or in juxtaposition to one another we learn not only how their interpretations of the work evolved over time, but also what strategies they used for interpretation in the first place. This, in turn, produced new knowledge about *Roberta Breitmöre* which has fundamental implications for the work's future preservation, presentation and exhibition.



Figures 2 and 3. Documentation of *Life to the Second Power*. Photos courtesy of Henrik Bennetsen and Gabriella Giannachi respectively.

Blast Theory's Day of the Figurines

Blast Theory's Day of the Figurines (2006) was a massively multiplayer board-game for up to a thousand participants who could interact with the game and each other remotely via SMS through their mobile phones from anywhere in the world. The game took place over a period of 24 days in a digital setting based on an imaginary British town within which players could visit a number of destinations, be allocated missions and dilemmas, and interact live with other players. The piece was developed in collaboration with Nottingham University's Mixed Reality Lab as part of the EU funded IPerG project (2004-8). The world premiere took place in Berlin at Hebbel am Ufer where the game was engaged with by 165 players.

To participate in *Day of the Figurines*, audiences visited Hebbel am Ufer where they found a large-scale white metal model of an imaginary town at table height. On the board, there were fifty cut-up destinations based on a typical British town including a 24 Hour Garage, a Boarded up Shop, a Hospital and a Rat Research Institute. Each of the destinations was cut out of the surface and bent up vertically to form a white silhouette. Two video projectors beneath the surface of the board shone through holes in the table and reflected off mirrors mounted above it enabling the surface of the table to be

augmented with projections of live information from the game. As part of the registration into the game, audiences selected a figurine from a display of one hundred figurines arranged on a second, smaller table (see Figure 4), gave their figurine a name, and answered a few questions about him or her which were designed to facilitate the construction of role play. Before leaving the space, they were given some basic instructions about the game, which explained how to move, speak, pickup and use objects, find other players, receive help, and leave the game. During the game, they engaged with other players, solved missions and dilemmas, including some which were formulated in real time by the game operators, in the attempt to stay alive in the game.

As a case study of the AHRC-funded Performing Presence project, I documented the creative development of this work and conducted a 24-day-long autoethnography describing what was happening in my life as well as to my character in the game (see Figures 5 and 6). While presenting some preliminary findings about this at the Mixed Reality Lab, I realised that the Lab held in-game data (see Figure 7) which, when juxtaposed against my documentation, offered a much richer picture of what I and other participants had experienced during the game, including evidence to the effectiveness of the design and orchestration



Figures 5, 6 and 7. Documentation of Blast Theory's Day of the Figurines. Photos courtesy of Gabriella Giannachi

strategies that are crucial for building an understanding of the work (Benford and Giannachi 2011). I also realised that a number of documentations had been produced by third parties that were available online which had not been archived in a systematic way. These audience-generated documentations, when juxtaposed against my autoethnography and the Lab's data, offered an even richer picture not only of how audiences experienced the work but also how they went about capturing it. Again, by documenting different members of the audience through a range of disciplines and enabling them to document the work through whichever means they chose, the work revealed richer epistemic qualities than initially assumed. This is because different data about the audience's engagement with a work (e.g. HCI, ethnographic data, autoethnographic data, video and photographic documentation, diary, etc.) produce richer accounts of an event. To preserve a complex work, it is therefore important that this range of voices are captured and interpreted in relation to each other.

Amalia Ullman's Excellences and Perfections

Amalia Ullman's *Excellences & Perfections* (2014) was a four-month performance which took place on Ullman's Instagram account, via a series of posts consisting of images accompanied by texts and strings of hashtags. The piece consists of three parts: Innocence, Sin and Redemption. For these parts, Ullman

fabricated a fictional character who acted as three different personae. These were a 'cute girl', a 'sugar babe', and a 'life goddess'. In the first section, Ullman is seen leaving her boyfriend and go to LA to become a model. In the second, she becomes socially isolated, takes drugs and goes into a rehabilitation clinic. In the third, she becomes socially isolated, she practices yoga, diets, and undergoes breast surgery. The three sections have a different look, with the colour scheme changing from pink and white to black and white and then again black to colour, almost like a set change in a theatrical performance.

For this work, Ullman deliberately shaped her online presence to show how easy it is to influence online audiences through the creation of the three parts which correspond to generic types the audience identify with. The piece, which attracted roughly 65,000 followers, brought together questions surrounding the veracity of social media posts, identity construction through social media, and the use of social media as a distribution platform. As in Hershman Leeson's performance of *Roberta Breitmore*, audiences stumbling across Ullman's piece most probably thought, at least at the time of the original broadcast, that her posts were authentic (in the sense that Ullman was not performing), although later posts seem to ask the artists for questions pertaining to the work (See Figure 8). In both cases the audience's responses, which, in Ullman's case, consisted in their comments to Ullman's posts, became part of the work. When *Excellences & Perfections* was exhibited in the group exhibition *Performing*



Figure 8. Amalia Ullman's *Excellences and Perfections*. Instagram screenshot. Photo Gabriella Giananchi.

for the Camera at Tate Modern, London (18 February-12 June 2016), Tate hung a set of three images of the artist as they appeared in Ullman's original posts and placed them in front of a table on which three ipads showed the social media pages in which the images had originally been shown. This was an important acknowledgement of the fact that the work in this case consists both in the image and its circulation (or reception). Though Ullman's work is still relatively under-researched and we don't know much about how the work was received other than what was captured by the press, the artist, and the relevant social media, this strategy shows how in digital art, new media and performance the capture of knowledge pertaining to context, including the audience reception over time, is crucial for preservation as well as presentation and exhibition purposes.

Robots and Dinosaurs, two immersive media experiences led by Factory 42

In 2018, the immersive media production company Factory 42 was funded by the Innovate UK Audiences of the Future programme to

develop two mixed reality experiences using Magic Leap. These were meant to be exhibited at the Science Museum and the Natural History Museum, as well as, through a smaller-scale version of the experience, at an intu venue, focusing, respectively, on the museums' collections of robots and dinosaurs. The experiences aimed to deliver on the museums' learning missions while also providing an engaging encounter with the collections. The mixed reality was complemented by the use of actors who were directed by the Almeida Theatre's Director of Participation Dani Parr. The experiences were supposed to attract a minimum of 100,000 users by the end of the funded period, and generate a scalable format, which could be applicable to different gallery and museum contexts. Prototypes of the experiences and content demonstrators were iteratively tested with the team and audiences, leading to two larger scale tests at the Natural History Museum Jarwood Gallery in February 2020 and the intu Metrocentre Gateshead in Newcastle in March 2020.



Figures 9, 10 and 11 showing different tests with audiences throughout the project. Photos Gabriella Giannachi.

Audience research, led by the two museums, featured high on the agenda and during the early stages of the project the different methods used by the project stakeholders to analyse audiences were looked into in great detail to identify the specific audience segmentation for this project and ensure the creative development took its distinctive features into consideration. At the same time, the creative and technical development proceeded, in parallel, leading to various iterations of R&D testing, focussing on existing audience observation, content development, prototype, technology and experience testing. Then, the onset of the COVID-19 pandemic temporarily put a stop to the project, which means that the research and development are not complete at the point of writing.

The ethnographic study of what audiences do in the Natural History Museum revealed that they expect to have a learning experience in the museum and are happy to spend some considerable time discussing specimen and their interpretation. While audiences like to be entertained, they do clearly expect to learn. The testing also revealed that there was great excitement about interactive and responsive exhibits and that audiences enjoyed a 'wow' factor (see Figure 9). To test how audiences might move in the relatively confined spaces in which the mixed reality experience was meant to take place, the creative team held a set of full day workshops with actors and found that the complexity of the experience, overlaying

physical and digital spaces with content that was both fact-driven and fictional, required careful scripting and experience design (see Figure 10). A further public test involved the first iteration of the *intu* version of the experience for the Metrocentre at the Jarwood Gallery at the Natural History Museum (see Figure 11). The final test was carried out at the Metrocentre.

The testing at the Natural History Museum's Jarwood Gallery highlighted the importance of the orchestration of the experience, by which I refer to computer scientist Martin Flintham's use of the term in relation to a team's ability to guide or shape an experience 'as it unfolds' (Flintham in Benford and Giannachi 2011: 209). This also showed, as is the case often in Blast Theory's work, that such complex mixed reality experiences tend to start and end before and after the event itself because of the onboarding or induction that is often necessary to familiarise audiences with technology and the offboarding or bleeding of the mixed reality into our every day lives. A number of factors emerged from the testing that shaped the course of the project, but perhaps the most crucial finding for the programme, Audiences of the Future, was the fact that at the heart of the experience was actually the audience itself, in the sense that the technology, the fiction, the set, and even the museum collections would be made sense of by the audience and therefore what the audience actually did was crucial to define and document what the experience

consisted of. In this context, it is important to note that not only art museums but *all* museums should dedicate more attention to audience documentation, not only as a marketing or research strategy, but for preservation, presentation and exhibition purposes.

Conclusion

There have been significant advances in understanding the relevance of participatory cultures in the museum context (Simon 2010), including, as art historian Claire Bishop indicated, that participatory artists often produce situations rather than objects and that their audience is reconceived as co-producer or participant (2012: 2). However, rarely have audiences been documented historically and even now, when they are documented more extensively, usually because of the investment of a specific research team, the documentations are rarely preserved in the museum context.

We have seen that digital art and new media documentation and art often coincide over time and so it is crucial that documentations are preserved alongside original artworks not only because they can lead to the creation of new iterations of a work, but also because they can capture various phases in the life of a work. Despite the fact that we know that artworks should be documented during the research, the development and the implementation phases, these complex documentations are rarely preserved or shared among museums. Similarly, while most works have different documentations, these are rarely brought together and analysed in relation to each other, which means that the context of each iteration of a work which is crucial for its preservation, and the voices of different parties that may have participated in the work are lost. This means that the epistemic value of a work is potentially impoverished and its qualities, as defined by different stakeholders, remain unknown. Finally, heritage, science and natural history museums do often document their

audiences, but these documentations are rarely shared with the public or used in presentation or exhibition.

Museums have only fairly recently started to document performance and time-based works through 'iteration reports' (Guggenheim) and 'documentation templates' (Tate). The latter includes feedback on public reception and visitor feedback, as well as feedback by curators, exhibition designers, media technicians, conservators and external contractors, indicating that these might help in understanding the behaviour of an artwork under different circumstances. These templates address the fact that works may have different iterations and that members of the public may have experienced the work in significantly different ways. With more and more museum work being participatory and experience-based, and with more and more art being delivered through different technologies, and heritage being increasingly interpreted through its non tangible qualities, it is crucial that audiences and their experiences are documented during all phases of the development of a work and that their iterative encounters with the work are also documented, preserved, presented and even exhibited. For the kind of art discussed here is not only a static image or object, rather it consists of the activation or reactivation of an event variously formed by people, materials, documents, heritage, specimen and technologies. This event occurs not only in front of but also through its audiences. To ensure the preservation of the epistemic qualities of these kinds of works, these audiences need to be documented through a range of strategies to reveal the complexity and diversity of the event they have in effect co-produced.

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Abstract

In my research I plan to examine the implications of the notion of the “virtual” in the arts and in the exhibition space. I shall focus on recent art and exhibition production, and touch upon their direct predecessors from the history of twentieth-century art. I argue that digitisation, together with the advances in virtual technologies, and the clash of virtual and actual reality via interfaces has significantly impacted the usage of exhibition spaces. The points of departure for my research are the exhibitions *Les Immatériaux* (1985, Centre Pompidou), net.art at *documenta X* (1997, Documentahalle), a part of *dOCUMENTA (13)* (2013, Fridericianum), and artistic endeavours such as the *Virtual Spaces* series of Cildo Meireles (1967–1968), Jeffrey Shaw’s *Virtual Museum* (1991), and the *Digital Museum of Digital Art, DIMODA* (2013–). The aim of my research is to provide a new context in which to interpret the notion of immersion, the dichotomies of virtual and real, material and immaterial, in relation to curating.

Keywords: binary opposition of presence and absence; virtual/real/actual/possible; virtual aesthetics; the postdigital constellation’s impact on exhibition- and art production; ‘immersion’ in the context of post-media condition; material turn

Introduction

While engaging with the shift in art production and practices related to computing, theory tends to focus on binary oppositions. Digital is obviously based on a dichotomy of 1s and 0s, and computer-based art practices are often analysed with regard to the relationship between the “real” and the “virtual”, and the related “presence” and “absence”. Further correlative binaries, such as transcendence and immanence or materiality and the apparent immateriality of information, are pairings of questionable opposition in Western thought, where presence dominates over absence. There have been countless attempts to deconstruct this logic on a sociological and political level, Post-structuralist, feminist, post-colonialism, and critical race theory, for example, but none as far as I am aware, regarding computing. Electric current flows or not in the circuit, triggering a one or a zero, a “yes” or “no” bit; an “indivisible” unit of information in a sign system.

Jean Baudrillard wrote in 1981 that the problem with everything being a system of signs is that they “lend themselves to all systems of equivalence, all. binary oppositions and all combinatory algebra” in the production of a “perfect descriptive machine” (Kinsey et al. 2004).

The descriptive machine, interpreted as computer, was labelled ubiquitous from the 1990s onwards. At that time commonly used terms emphasised the immaterial and intangible character of computing, such as cyberspace, virtual reality, and so on. “There is no such thing as globalisation, there is only virtualisation” (Redhead 2004) according to Paul Virilio. Current theories – this tendency is visible in the art field as well – focus rather on the infrastructure

than on the intangible flow of information or impalpable constructions composed by algorithms, for example, Benjamin H. Bratton’s “stack” theory (Bratton 2015). Bratton refers to a layered structure, which includes the Internet, its infrastructure, its users, their urban networks, and ultimately the Earth itself.

Materiality, the Internet’s body, the solid construction of computers, the actual presence of the stack seems to be more important than its spatial nonpresence. Thus, further on in Bratton’s text, the relation of the actual and the “computed” word can be described within the framework of dichotomies, such as tangible and intangible, virtual and actual, or material and immaterial. Computer-simulated VR environments, immersive immaterial installations, “realist” representations of actual phenomena do not interfere with sovereignty of nation states, nevertheless they are present somewhere, rather than absent, and take up space, whether we call them “virtualities” or something else.

The virtual is a substitute – “acting without agency of matter” (Friedberg 2006) – an immaterial proxy for the material. The term becomes a key marker of a secondary order in the relationship between the real and its copy, the original and its reproduction, the image and its likeness.

Results

One example of how digital immateriality is being presented in international group shows illustrates how controversial this can be. Catherine David included net.art pieces at the *documenta X* in 1997, which were exhibited on cathode-ray tube monitors connected to personal computers at the Documenta Hall in Kassel.

The bare materiality of the virtual was on view, and thus cyberspace was enclosed in tin cans and staged at Kassel. A few other international exhibitions of net.art followed, in an attempt to keep up with the trend. As a result, two years later net.art was declared dead by an important figure of the scene, Alexander Galloway. "Alex Galloway in his essay titled "net.art Year in Review: State of net.art 99" in the journal Switch. "Net-dot-art is dead," he declared, noting net art's inclusion in Documenta 10, in 1997, and the upcoming 2000 Whitney Biennial, as signifiers of its demise." (Durón 2016).

Thus it should be reasonable to remain with binary oppositions, not only in computing, but in curating, and to let presence dominate absence, whether it is computer-based or not. One scenographic element at the dOCUMENTA (13) in 2012 – going back again to Kassel – appears to refute this principle. On entering the Friedericianum, the "brain" of the dOCUMENTA (13), what the visitor encountered was neither tactile nor visual: just a breeze and distant-sounding vocals (Ryan Gander's artwork *I Need Some Meaning I Can Memorise*, (*The Invisible Pull*), 2012, and Ceal Floyer's artwork *Til I Get It Right*, 2005) in empty rooms with walls painted white. This was a deliberate curatorial decision that highlighted the tension between materiality and immateriality.

I do not wish to write a history of the presentation of computer-based art in international art shows; rather, I wish to point out that in the above mentioned latter case "presence" seemed to strike a bargain with "absence", which probably resulted from the lack of an interface between the viewer and the artwork. The questions remain: What happens if technology blurs the boundary completely between actual and virtual presence? What does the deconstruction of this dichotomy mean for the exhibition space? What is the exhibition space? Should it be, will it be deconstructed by digital means, that is, the computer-generated space? Digital art carries the promise of infinite

reproducibility, because it is not tied to any single exhibition context and can be accessed from all over the globe on personal computers by anyone at any time. Based on ubiquitous computing, it brings a second wave of democratisation of the arts after their mechanical reproduction. Actually, maybe this is the first genuine wave; this time there is no single original, the copy equals the original. The "aura" surrounds each and every access to, or iteration of a digital artwork, even every apparatus-made piece. Or is the aura, originally related to material qualities and uniqueness of a piece, really a thing of the past? Does it end the accentuated ontological status of an artwork? What does it do with the exhibition space? How will an exhibition look, if we are to curate mere "things"? An landmark exhibition of the 1980s possible provides an answer to this question.

Les Immatériaux was a thought experiment manifested in an exhibition; it was a showcase of scientific, technological, but also artistic practices, and what is more, it was a reflection on the exhibition as a medium and an interface. Jean-François Lyotard's postmodern vision, which staged various specimens, including artworks, artefacts, and objects illustrating scientific developments, has been an influential exhibition ever since. With the title *Les Immatériaux* Lyotard sought to opt out of Cartesian dualism and thus break with modernism (Broeckmann, Hui 2015). Retrospectively, the show was one of the first important steps in the institutionalisation of media art, and also as a curatorial game, a hop-scotch, which allowed jumping between materials and their encoded representations, all in order to illustrate the network of telecommunications, and its impact on any topic from bioengineering to the body image during pregnancy (Annegret Soltau, Schwanger [Pregnant], photo collage, 1977–1982).

Discussion

Computer-generated art, or art encoded in binary, has been labelled "media art", which has always been a problematic term, and in a certain way it is a product of postmodernist detachment of signifier from signified. Recently, discourses have shifted from being medium-centred (Leeb 2017), in spite of the fact that the nature of media art remains undisclosed, the debate unresolved. Media art, or new media art, has been defined as apparatus-based (Weibel and Zielinski 2018), some of which is driven by algorithms- and dependent on specific software and hardware, and as these tools age, it is dependent on their emulation. Debates on the definition of media art, or its integration into the art historical context (Grau 2003) are never-ending. However, this media theory debate and state of perplexity – even almost twenty years after Rosalind Krauss declared the era of the post-media condition – signifies that the very ontology of representational art practices is shifting, caused partly by the expansion of computing, which impacts the materiality of an artwork and thus its presence in the exhibition space. Beryl Graham and Sarah Cook still distinguish new media art from other forms of art production (Graham and Cook 2010), and want to rethink curating in terms of this distinction. However, this only leads the curatorial discourse back to the media condition, while in the midst of being "post", so to overcome this distinction is inevitable.

The concept of the White Cube, "an endless source of contention in curatorial discourse" (O'Doherty 1976), is a historically and ideologically loaded phenomenon; although constantly criticized, it is still widely used. The realm and institutional structure of apparatus-based art has been left seemingly untouched by the debate, even though extensions to cyberspace, via different interfaces, imply there is a discourse on this topic. Instead of museum practitioners, theorists, or curators, artists engaged in deconstructing and virtual

reconstruction of the exhibition space, of museum interiors, and ultimately the White Cube. Jeffrey Shaw's installations from the early 1990s are in part the products of the obsession with VR at that time, and in part due to an interest in the virtualisation of cultural heritage, specifically in *Virtual Museum* (1991). The installation creates a computer-generated environment, which we would nowadays call augmented reality, in which the white-painted walls of the gallery space become displays of animated letters. In a very early series of his, Cildo Meireles "provides an analysis of the phenomenon of virtuality through Euclidean principles of space (three planes of projection) transposed to the image of an internal corner of a house." (Brito et al. 1981) It is not an exhibition situation, but nevertheless the perceptual paradox and spatial ambiguity it refers to sheds light on the spatial aspects I wish to deal with.

One recent example of mixing virtual and real exhibition situations is John Rafman's *Sculpture Garden (Hedge Maze)* (2015) at the Zabudowicz Collection, and an example of an entire institution founded in the virtual realm stands for the completion of "dematerialization". DiMoDA, conceived in 2013 by Alfredo Salazar-Caro and William Robertson, is a classicist museum from the outside, with a gate to virtual environmental art in its hallway.

Conclusions

These artworks raise ontological questions about the exhibition space, material presence and its opposite, and the entanglement of the viewer in virtual and real space, which might lead to a "material turn" in curating. Wiebke Gronemeyer (2018) suggested using the term, although she understands it as an awareness of certain processual transformations that curatorial practices might cause, with an emphasis on the actor-network relation, resonating with Actor-Network Theory and the neologism of intra-actions (Barad 2007). These concepts are embedded in theories that undermine the

substance of matter, and suggest an ontological shift, which invades the validity of ontological functors, separated into oppositions of real-actual and virtual-possible (Deleuze 1966).

At this point the definition of virtuality could be merged as follows: “[v]irtuality is the cultural perception that material objects are interpenetrated by information patterns” (Hayles, 1995), which might have interesting implications for exhibition spaces, whether they take up physical space or computer-generated space, whether they are places of discourse or knowledge production, or whether they move beyond the coercion of production and remain “spaces for thinking” (Sheikh 2009). This section is not mandatory, but can be added to the manuscript if the discussion is unusually long or complex.

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Abstract

This paper traces the origins of the power relations present in immersion. Immersion is a modern experience that the baroque invented to access a situation where the newfound relativity made new methods of communication necessary. The paper analyses selected examples (from ceiling painting to theory of conversation) in order to grasp the structure of this power relation present in baroque culture and reappearing today in force. Immersive simulation consists in a) dissimulating depth and creating a surface; b) eliminating the distance between the spectator and the vision; c) providing a predefined point of view. Simulation of the power and empowerment are two faces of the same relation: the same situation that engendered the first made possible the second. Resistance to immersion and radical immersion are possible forms of empowerment in this frame.

Keywords: empowerment; neo-baroque; simulation; ceiling painting; society of the spectacle;

Introduction

Baroque is the birthplace of modernity. It was for Alois Riegl (Riegl 1908), who characterised it as an era of subjectivity, and it was even for Gilles Deleuze (Deleuze 1988), who thought of it as an atemporal form of modernist art and thought. In my mind it is the beginning of modernity, the first era of the surface without depth. The first era of “civil conversation”, a pre-truth era where the well formulated lie made greater impression than the bare truth. The first era of modernity when western thought encountered the fact that depth, substance and truth are not pre-established but have to be produced, moreover, encountered its own relativity, contingency and fragility (in face of a world without transcendent truth - a world of simulation and dissimulation -; in face of other thoughts, radically different forms of the truth). An era of simulation, immersion and power representation, the first era of the simulacrum, but also the era of the critique of immersion and the production of a subject powerful enough to reject the simulacrum. We are living in a New Baroque, a post-truth world of immersion and simulation. Baroque ceiling paintings and virtual reality: two forms of expressions of the same power relation. Is this the rebirth of baroque after modernism? One must rather think of modernity itself as a constant struggle between immersion, simulation, and subjection on one hand and reflection, empowerment on the other.

Theories of art and culture often regard baroque a perfect model of contemporary cultural phenomena. Some of the recent examples are Angela Ndalianis (Ndalianis 2004) who speaks about Neo-Baroque Aesthetics with regard to contemporary popular art, Gregg Lambert (Lambert 2004) who re-evaluate the 20th century history of the “return of the baroque in modern culture” from Walter Benjamin to post-colonialism, Guy Scarpetta (Scarpetta

2014) who traces the return of a baroque “grand style” and Timothy Murray (Murray 2008), who speaks about digital baroque referring to new media. Common to these works is the effort to show the similarities between baroque and contemporary phenomena. Naturally, these efforts gave birth to fierce reactions by historians of art who condemned the superficial and underlined the importance of structural differences. Acknowledging the correspondences, our work differs from these efforts in a structural point of view. Instead of contingent similarities it focuses on a historic event that laid the foundations of modernity as a whole. An event that governs even our understanding of visual culture, public spaces, public opinions and even the representation of society and societal relations. Instead of a baroque revival, one should speak of the historic repetition of an answer to a specifically modern situation. Modernity begins with the acknowledgement of the relativity and contingency of our existence, the disappearance of a confidence in the pre-given depth of the existence: hierarchy of the being, essence in the scholastic meaning, centre of the closed world etc. The first answer to this new insight was the baroque: an era of the absoluteness of the surface (the affirmation of the situation). Enlightenment and high modernity worked out a different answer: the construction of a new depth (modernist culture with its Universalist claims), but high modernity is over, we once again live in an era of the surface. The similarities are not contingent; they originate in the necessity of an answer to repeated conditions.

Baroque power relations then and now*Immersion*

Immersion is a phenomenon associated with contemporary virtual reality, be it art or simple

entertainment. Likewise, its predominant questions are concerning the problems of its media: virtual reality or nowadays augmented reality being the per se media for such an experience. It would be easy to show that immersion existed way before virtual reality has ever been invented, a number of modernist cultural phenomena firmly providing media capable of presenting even the deepest immersion: the so called revolution of reading enabled the solitary reading, the illusionist painting made the visual immersion possible, the "aesthetic" listening to music provided an immersed sound experience. Our aim lies elsewhere. We would like to offer a different view on immersion: not as a problem of mediality, but a problem of power relations. Naturally, immersion as a power relation supposes a medium, and creating a medium is always part of the construction of any relation. Baroque immersive audio-visual culture could not exist without a specific audio-visual medium: like the ceiling, be it the ceiling of a church or a palace, as the primary visual medium for ideological mass communication and power representation; like the opera, the oratorio, and the mess as the primary audial medium for the affective mass communication. Even the chapel of a baroque church is a medium for personal immersion in one's own faith. Immersion indeed relies heavily on the medium. Nonetheless, it is a historical question what media are capable of providing immersion for the given audience. Visual or textual, prose or verse, sung or read: every single or combined types of media have already been able to fulfil such a role.

What we are interested in is constant or at least constant in a specific historical period or more precisely under a specific historical event: modernity. Immersion is but one of the specific power relations that characterizes modernity. It offers not only a specific experience, but also more importantly a specific potentiality: a possibility to see, hear or feel or even to act according to a simulated reality. Immersion is specifically modernist, because it supposes a

specific event: the construction of the surface without depth. To be immersed means to alter ones existential setting, to alter the "world" one is immersed in the first place. This supposes the possibility of other worlds, other realities, and it is not by chance that even the concept of the "possible worlds" originates in the baroque philosophy.¹ The Baroque encountered the relativity of its own world, after a century of wars of religion, Protestantism and counter-reformation, the shocks of revolutions and birth of self-dependent republics in Switzerland and in the low countries: it had to realize that every single point of view is relative to other ones. A modern world is a world of equalities that lacks the pre-given hierarchy of the ancient world.

One of the possible reactions of the ruling powers to a situation of relativity (i.e. the loss of the imaginary natural hierarchy among people) is the investment in mass persuasion by the proliferation of rhetorics and communication technics. Immersion is quite appropriate to fulfil this goal. In immersion one possesses only simulated powers, by the grace of the simulated world she is immersed in. Indeed, baroque immersion is not a specifically artistic phenomenon. It is a general structure of social representation; David Carrier even speaks about a "society of the spectacle" in relation to 17th century Rome. "Rome's rulers devoted a great deal of effort and expense to making, viewing, and maintaining spectacles. In speaking of these Baroque spectacles, I allude not just to the art in churches, but also to the way that Rome itself became visually tantalizing. Modern tourists know, for example, that the facades of Santa Maria dei Miracoli and Santa Maria in Montesanto were modified by Gian Lorenzo Bernini and Carlo Fontana to provide a vista for travelers entering the city from the north. That architectural transformation remains visible; but we have few records of the lavish festivals, which frequently occupied public spaces" (Carrier 2009, 41) These festivals provided spectacle the participants were so much immersed into, they had to realize

that their responses were made „either by god or by Bernini" (Carrier 1993, 208).

The iconic medium of baroque immersion is ceiling painting: while it is not the baroque that invents it, the baroque transforms it into a medium of power representation. Ceiling painting obviously requires a ceiling, but Rome's pre-renaissance churches were basilicas: they had wooden ceilings without any vault. The first barrel-vaulted churches – which provided sufficient surface for large-scale *quadraturas* – were built in Italy during the renaissance. Renaissance principles however opposed the decorative painting of the ceiling. The vault plays an important role in the totality of the edifice: it concludes, finalizes it, this role has to be emphasized; it cannot be hidden behind some decorative painting. Consequently, Alberti in *De re aedificatoria* suggested very modest decorations, either the star dotted night sky in the style of the Battistero of Florence or a cassette ceiling in the style of the Pantheon of Rome. Indeed, the San Pietro of Rome is vaulted with a cassette ceiling. (Wittkower 1971) It is Vignola's church design that first offer a paintable surface for the baroque ceiling painting. *Il Gesu* and its later sister churches possess a lunette barrel vault adequate to be painted as a single surface. These surfaces were becoming gigantic movie screens the next two hundred years, offering immersive visions of heaven (or Olympus in the case of aristocratic palaces having similar vaults) never seen before.

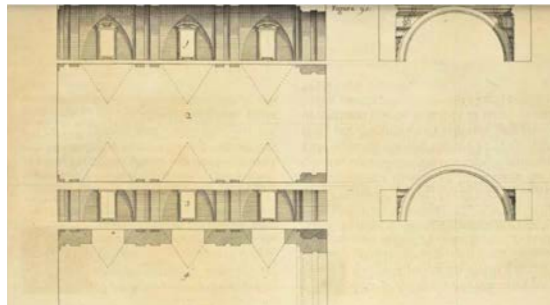
Nonetheless, it is not the triumph of decoration over purism we encounter here. Baroque ceiling painting has nothing to do with decoration. A more profound change has happened between the renaissance and the baroque that the case of the ceiling painting exemplifies. Renaissance principles opposed decoration since it would have hidden the *essence* of the building. The essence of the building, and moreover the essence that is expressed by the building, the essence of creation, the perfect harmony and the hierarchy of being, had to be shown, had

to be exposed in the design of the building itself. Decorations would have hindered the building to express its own essence and through its own essence the essence and perfection of the creation. Rudolf Wittkower has traced that effort fully (Wittkower 1971). When the baroque opts to "decorate" the ceiling it is not a simple quarrel with the renaissance, it is the refutation of its very principle: there is no essential hierarchy. Naturally, this assertion had been reached in a long gradual process; the baroque formed its own ideology in different domains and in different times, but the phenomena point to the same end. There is no centre of the world, because the world is infinite (Galilei, Descartes). There is no essential hierarchy among the people, because in the natural state they are equal (Hobbes). There is no essential central view of a statue (Cellini) or a city (Pascal) only the infinity of potential point of views. Moreover, there is no essence in general: the scholastic philosophy called essential differences the differences in the hierarchy of being; Descartes, Spinoza and even Leibniz formulated the concept of essence without the help of the pre-given hierarchy of the Nature.

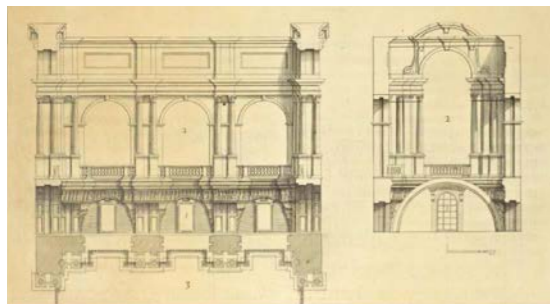
The interior of a baroque building has no natural hierarchy to express; it is pure surface. A surface that has no depth: there is nothing behind it, it does not conceal it does not reveal. It is self-contained, autonomous even autochthon. It only transforms. It transforms itself into the skies and the havens. It *simulates* havens while *dissimulates* the ceiling. Dissimulation is a key concept in the baroque theory of conversation it refers to the concealment of a loss one had suffered, or the artificiality of one's effort to please, or the hard work behind any effort. In general, dissimulation is the concealment of a depth behind the surface. It is not a simple lie, it is even a kind of a virtue according to Italian theoreticians of the late sixteenth century. A baroque ceiling painting is just as dissimulative as simulative: it dissimulates the structure of the building that gave place to it. For example, it erases the difference between the barrel vault



(a)



(b)



(c)

Figure 1. Andrea Pozzo's drawing of the Sant' Ignazio of Rome (a) the original architecture, (b) decapitating the building: the vault is virtually reduced, (c) erecting a painted colonnade that simulates a space open to the heavens.

and the lunettes making them both appear to be a false building erected on the top of the church walls offering insight to the heavens.

Andrea Pozzo, perhaps the most advanced master of baroque ceiling painting, whose illusionism practically replaced the vault with the vision of a new edifice, has documented his own work in the Sant' Ignazio of Rome. By a series of

drawings (Pozzo 1693, fig 94-100) he has shown that in order to paint a *trompe l'oeil* painting of an illusory colonnade erected on the real walls of the church, one has to dismantle the existing vault in a precision drawing and construct a new build plan similarly to an architect. The dissimulation of the vault is almost literal: apart from the fact, that actual construction work is replaced by an accurate painting, the work is the same: the painter has to start with the decapitating of the building. The depth has to be eliminated; a pure surface has to be constructed.

The dissimulation of the vault leads to the simulation of a new kind of space. The interior of the main vault is transformed into a space where the communion between the *civitas dei* and the spectator becomes possible. The difference between the painted space and physical space is eliminated with the help of extensive illusionism where the figures of the fresco are flying "under" the illusionary building, creating an illusion of an uninterrupted transition between the worldly and the heavenly space. The spectator loses its "aesthetic" distance to the painting, becomes a participant of the spectacle. Moreover, the spectator is required to be at a certain point to be able to apprehend fully the spectacle. The illusionism of the painting is so extensive that it provides only a distorted picture if it is seen from a different point under the vault. The expected point of view is indicated on the floor of the church. The immersive picture creates the place of the spectator. Creating the subject of the spectator consists in a) dissimulating depth and creating a surface; b) eliminating the distance between the spectator and the vision; c) providing a predefined point of view.

The Reign of the Opinion

The construction of the surface without depth, required for an immersive space is not exclusive to visual culture in the baroque. Simulated virtual reality existed in verbal and literary culture as well. Baroque is the era of "civil

conversation": a form of public space where the surface, consisting of opinions, reigned.

Civil conversation was born in Italy during the late renaissance as a form of etiquette for the court of Italian princes. Il *cortegiano*, the courtier had to acquire a certain set of (physical and mental) competences ranging from horsemanship and fencing to poetry and conversational skills to be able to please the court. By the early 17th century, the skills in the art of conversation became the perquisite for the entrance to the society. Most importantly in France where society and conversation have lost its exclusive connection to the court and in general to noble birth. It became a general form of "civilized" life (that is the life of the mainly workless ruling classes) and the framework of any ambition, any power game.

Since the aim of the conversation is to please, it is critical toward any depth. For example according to Nicolas Faret, author of one of the most well-known 17th century French book on the *Honnête homme*, to learn (scholastic) philosophy is a waste of time, it is quite enough to get in familiar with "some of the most delicate questions" of the tradition of philosophy that sometimes appear in elegant conversations. In general, it is better to know many things to some degree than one thing in depth, because that way one would be silent in the elegant society very often. (Faret 1925, 7)

The most important imperative of the communicative situation of the conversation is the absoluteness of the opinion. What is expected in a good company is to formulate a witty opinion, to present it gracefully, to be ready to change it, and most importantly to be able to fight for it. The ultimate aim of the conversation is to gain the grace of the prince, women, even God. Fight for the prize or be vanquished and lose the grace. One does not need to speak ad *hominem* in a conversation: the well-formed opinion is the personality itself. Montaigne,

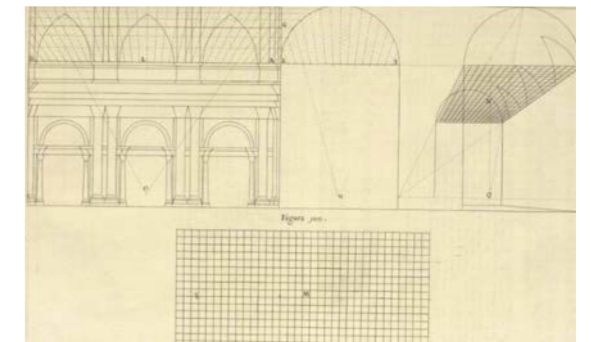


Figure 2. Andrea Pozzo's drawing of the Sant' Ignazio of Rome: constructing the fresco on the vault using a single point of view.

who was an unquestionable authority on conversation by the 17th century said:

„But to get on: what greater victory do you want than to teach your enemy that he cannot stand up to you? Get the better of him by your argument and the winner is the truth; do so by your order and style, then you are the winner!

I am persuaded that, in both Plato and Xenophon, Socrates debates more for the debater's than for debating's sake; more to teach Euthydemus and Protagoras their own absurdity than the absurdity of their sophists' art. He seizes hold of the first subject which comes to hand, as a man who has a more useful aim than to throw light on his subject as such: namely, to enlighten the minds which he accepts to train and to exercise. The game which we hunt is the fun of the chase: we are inexcusable if we pursue it badly or foolishly: it is quite another thing if we fail to make a kill. For we are born to go in quest of truth: to take possession of it is the property of a greater Power. Truth is not (as Democritus said) hidden in the bottom of an abyss: it is, rather, raised infinitely high within the knowledge of God.

This world is but a school of inquiry. The question is not who will spear the ring but who will make the best charges at it. The man who says what is true can act as foolishly as the one who says what is untrue: we are talking about the way you

say it not what you say. My humour is to consider the form as much as the substance, and the barrister as much as his case, as Alcibiades told us to." (Montaigne and Screech 1993, 1050)

Truth is unreachable thus in the war of opinions the winner is the one with most *honnêteté*. The equality of opinions necessarily leads to war, where not truth, but the "order and style", wit and gracefulness matters. The reign of opinions means that every opinion is acceptable but only opinions are acceptable ("all opinions are the same to me and it is all but indifferent to me which proposition emerges victorious." (Montaigne and Screech 1993, 1048): only witty responses, only *bon mots*. All of this relies on a rhetorical education that has to be dissimulated. The conversation has to look natural, as if it was not learned but innate, Castiglione had a word for this: *sprezzatura*.

The Coming of the New Baroque

A new era of the surface, the era of the information capitalism has been born. It can be characterized as an "information society according to the state of its forces of production [... while it is] capitalist in its relations of production." (Fuchs and Sandoval 2014, 2). Then again, "information" can mean anything from a scientific truth to a blatant lie or a simple digital data. An information driven society is not necessarily an informed society. Today a victorious discourse of the digital *res publica* announces its omnipresence and omnipotence. We are supposedly living in a world of cooperative knowledge production, computer aided cooperative production and even reaching closer to a "zero marginal cost society" (Rifkin 2014) through internet aided cooperative work that could supposedly render capitalism obsolete.

In reality it is hardly an exaggeration to say, that today's model of information is the bubble not the cooperative production of knowledge. It is a post-truth society rather than a new era

of the emancipated knowledge. By post-truth society, I do not mean an era where there would be no truth; I refer to a society that is uninterested in truth. A society where masses of people do not care about what is true and what is not. Where the means of the validation of truth are mocked and where every opinion is equal, be it falsifiable or not, argued or not, universal or not. Where every opinion is based on a certain "point of view" that is equal in every respect to other opinions. A post truth society is not to be confused with a radical society, where dominant ideological point of views would be brought to tribunals of the people. A radical society would be (and always was) a society without any *particular* "point of view" where only the universal point of view would be acceptable. A post-truth society is a society without *societas* without anything common, where there are only different points and different views but there is no real cooperation among these (only cooperation through the market of opinions: information capitalism). Cooperation produces truth, revolution produces truth, culture produces truth.

The "collateral damage" caused by the equivalence of opinions on the social media (from trolls through internet bullying to information bubbles and post-truth publicity) in reality offers us an insight to the reign of opinions, the era of the absoluteness of the opinions. The dictatorship of the opinions prescribes an iron rule for every subject of the information society: you have to have an opinion, and only an opinion. The obligation of having an opinion became the only possible instrument of self-fashioning in the social media. Expressing someone's individuality means forming an opinion on everything: posting ones political commitment the same way one posts his or her fashion preferences. In defense of one's opinion one has to march into battle every day: one have to commit every available resource of communicative competence and capital one has. Debates on forums, the Facebook, the twitter are different but all of them shows the

same baroque affection to the *bon mots*, the instant replicas taunting and ridiculing the other

Resistance to the Surface and the Radical Immersion

How can immersion be empowering? Is there any radical kind of immersion? Is there any possibility of empowerment in the era of the surface?

17th century Classicism was clearly a movement that opposed the simulated power provided by the grace of baroque ruling power. It was critical by rejecting immersion. The ceilings painted by Annibale Caracci and his pupils, like Domenichino, and even Poussin, in the case of the unfinished and later destroyed project for the Long Gallery of the Louvre (Blunt 1951), shows us that classicist painters rejected the illusionistic ceiling painting like that of their contemporary Pietro da Cortona, by rejecting the dissimulation of the ceiling. Classicist ceiling paintings most of the time are pictures in a frontal perspective (as opposed to perspective *sotto in su* required for quadratures) they even have conventional (painted) frames, as if they had been pictures on canvas pinned to the ceiling. Their aim was to keep the distance between the viewer and the picture, the viewer was to see the picture *as picture*, she had to had a conversation *on* the subject of picture (like the triumph of Bacchus in Caracci's ceiling in the Farnese palace). This was indeed a project of empowerment, the empowerment of the viewer, who – instead of relying on a simulated power to ascend to the vision of the heavens – had to rely on her own power of an informed viewer. This is a reflexive relation where the picture does not create the viewer but enables it, empowers it. However it is not a radical immersion: it is the rejection of immersion.

On the other hand, one can indeed find some examples for a radical immersion in the baroque as well. Giovanni Carreri for example (Carreri and Lappin 1995) describes Bernini's Fonseca Chapel as an immersive space made for

personal faith, where the viewer *participates* in an imitation of the event of Salvation (thus it is clearly a space for the simulation of the divine power). However at the same time it makes the viewer reflect on this *imitation*: Bernini picks an annunciation as an altarpiece (a copy of an annunciation of Guido Reni) picturing the Virgin Mary as she signals (by the posture of her hand) the event of the Salvation. The sculpted angel holding the picture imitates this meaning (also by her similar posture) and shows it to another sculpture: the patron of the Chapel who imitates the posture himself as well. This chain of imitations informs the viewer not only about the imitated event, but the imitation itself. The sculpted angel holding the frame of the picture is at the border of the physical space and the painted imaginary space. It transcends those spaces but this transcending is not dissimulated by an illusionary transition between the spaces (as it is the case of Pozzo's ceiling), it is recorded, it is underlined: 'you have to transcend your world in order to imitate Christ'. This immersion is radical: it requires the action of the participant to *transgress* his or her world.

Nonetheless, baroque radicalism is always questionable. Is this transgression really an empowerment of the subject or his or her enablement by the divine grace? To present an example for immersion, which is radical in the sense that it is not only transgressing but also empowering, one might have to find contemporary cases. Pippilotti Rist for example presented her video installation *Homo Sapiens Sapiens*, at the Venice Biennale on the ceiling of the San Stae Church by the Grand Canal. The installation was projected to the ceiling, while the viewers had to lie down on the floor, on giant leaves. Rist pictured the Paradise on the ceiling but with a twist: she featured two women and perfect innocence instead of the original sin. "I'm celebrating pure innocence, which is something good," explained Rist. "I don't want to be provocative. I'd like to show how things might have been if we had not had to feel permanently guilty" (swissinfo 2005).

In my mind, this is a radical immersion that demonstrates direct reference to baroque ceiling painting: presents a simulation of an alternative and empowering reality.

Conclusions

Immersion is a power relation, created in the baroque to simulate the power of its participant instead of empowering her. By the dissimulation of one's own world and simulating another, it provides a predefined subject position and power to act. Resistance to the simulation was present even in the baroque in the form of classicist painting, that rejected the dissimulation and empowered the subject by reflection. Radical immersion (that is an immersion that itself empowers its participant) is harder to find and quite possibly a contemporary phenomenon.

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Abstract

Floating Reverie is an online digital residency programme started in early 2014 as a result of a perceived lack of platforms & opportunities available to artists using new media & digital culture in South Africa and beyond. The programme consists of two components, the //2Weeks residency and the Post-Digital instances. The //2Weeks residency happens once a month, artists are invited to participate and for two weeks to create work online, iterating the same concept daily by checking in on their platform of choice. Once the year has been completed, artists are invited 'back' to be part of a Post-Digital instance which reflects, references and expands on the digital iterations of their residency.

This paper will discuss specific //2Weeks residencies as part of network cultural production, engaging with process, research and practice online in light of the reflective publication *Floating Reverie 5 Years 2014-2019*. This publication played a crucial role in compiling and reflecting on the various residencies that resulted from Floating Revere. This paper forms part of a bigger research investigation I am doing on the changing roles of artists and curatorial creative practice in a digital and physical space emerging in the Global South.

Keywords: digital art, internet art, digital residency, digital curating, Global South

Introduction

This paper, an adaption of a presentation DRHA2019 conference titled "Radical Immersions: Navigating between virtual/physical environments and information bubbles", will discuss Floating Reverie and its two components, a //2Weeks residency and Post-Digital instances, which have come to reflect and explore a networked curatorial production. I will be engaging with specific patterns and tendencies that have emerged in selected artists' practices focusing on process, outcome and the medium that they explore in both the //2Weeks residency and Post-Digital instances. These patterns, will be the start of connecting the digital and physical space which Floating Reverie occupies. This paper comes at an interesting point in Floating Reverie's timeline as it has been running for five years (as of January 2019), which has culminated in Floating Reverie's publication - documenting, reflecting and exploring the residency programme titled *Floating Reverie 5 Years 2014-2019*. I will reference the curatorial notes from the publication and past articles I have written in order to draw further insights for this article. It is important to note that my research on Floating Reverie is a starting point for a larger research project on the changing roles in artist and curatorial creative practice in a digital and physical space.

Floating Reverie – a site for iteration

The publication served as a poignant moment to consolidate my definitions and descriptions of Floating Reverie up to this point. Floating Reverie is an online digital residency programme that I started in early 2014 where my role as curator has expanded and evolved over the duration of Floating Reverie's existence. The publication reflects on the first five years of Floating Reverie, from January 2014 to January 2019. In the publication, I identify that "Floating Reverie has

hosted 33 residencies for 35 artists. Of these residencies, there have been 27 independent artists, two collectives, two collaborations, and two cross-residency collaborations, all of which have culminated in five Post-Digital instances" (Whitaker, "Floating Reverie - Description" 11). The majority of these artists originate from South Africa. The gravity of the number of participating artists, became clear and provided validation as I compiled the publication and reflected on the scope of the archive and documentation.

The programme consists of two components, the //2Weeks residency and the Post-Digital instances. The //2Weeks residency happens once a month, "artists are invited to respond to the brief: 'You have 2 weeks. 14 days. 336 hours. 20 160 minutes. What will you do?', in order to produce work, or 'check-in', online every day for two weeks" (Whitaker, "Floating Reverie - Description" 11). The artists select a platform of their choice such as Tumblr, Instagram or YouTube to host their residency on. It is deliberately "not location-specific, and exists solely in the digital world, which can be an empowering aspect for many artists" (Whitaker, "Floating Reverie - Description" 11). Floating Reverie presents artists "with a framework, guidelines, and conditions" through which they are facilitated to explore repeatedly, "dynamically changing their creative process daily" (Whitaker, "Floating Reverie - Description" 11). The Internet presents a new space for artists and curators, versus traditional spaces. It has the power to offer a platform to artists and curators to destabilise traditional or conventional galleries or exhibition space and conventions.

At the end of the year, all participating artists are invited to be part of a Post-Digital instance which "occurs at the end of the residency year when artists ... respond to their residency

and process” (Whitaker, “Floating Reverie - Description” 11). Through the Post-Digital instance, a space is created for the artist to extend their practice, “to perform a re-imagining and to re-engage with the residency” (Whitaker, “Floating Reverie - Description” 11). The intention of the Post-Digital instance is reflective and allows the artists “to interrogate their own experience of the residency, their process, research, and how they produced work” (Whitaker, “Floating Reverie - Description” 11). This ‘re-locating’ of their practice and a recontextualising of a digital practice, from a virtual space to a physical space, is at the heart of the intention of the Post-Digital instance. The Post-Digital instance too, has seen iterative curatorial strategies implemented over the years.

From Tumblr to Instagram

In the essay I contributed to the publication *Internet and Post-Internet Art – Floating Between the Two*, I note the following about the platforms selected by residency artists. Out of the 33 residencies from 2014 - 2019; 13 residencies used Tumblr, 10 residencies used/developed their ‘own sites’ with unique URLs, 7 residencies used Instagram, 3 residencies used YouTube, 2 residencies used New Hive and 1 residency used SoundCloud. What adds additional understanding of the preferences, is the fact that in 2014 and 2015, Tumblr ‘peaked’ and in 2018 Instagram ‘peaked’ as the platform of choice. In 2017, two of the eight residencies used Instagram, and in 2018, five of the six residencies used Instagram for grid posts and stories generating content daily for, and through, the platform” (Whitaker, “//2Weeks 2014 - Description” 34). This is reflective of the decline of Tumblr and rise of Instagram in contemporary popular culture and as a platform to showcase artistic practice. Tumblr was the first micro-blogging site where people used to explore content creation and generation, sharing and re-blogging a particular aesthetic. This space, in contemporary popular culture, has been fulfilled by Instagram over the past few years. This

observation about Tumblr relates directly to what has become known in popular internet culture as the ‘death of Tumblr’ (Eloise; Orr). Carol Kino in her article *How Instagram Became the Art World’s Obsession*, describes Instagram as “an indispensable, all-purpose tool for everything art related” (para.2). So, it makes sense that artists would use it as a site for their practice, to reveal process and production in an iterative manner. The residencies are subsequently “framed and positioned within the platform of choice” which “sets up a narrative of content unique to the artists’ own practice” (Whitaker 239).

Iterative emerging online patterns

In the publication, I start to outline various patterns and tendencies that emerged through the artists’ different practices from their //2Weeks residency and Post-Digital instances. Although I start to look at the variety of content generated in relation to the medium selected and explored, the publication is not a comprehensive analysis of all the residencies nor all-encompassing of all patterns which have emerged. I have, however, in various other articles expanded on this and will continue to do so. For this article and for the presentation, I have selected the //2Weeks residencies and Post-Digital instances of two artists - Brooklyn J. Pakathi and Daniel Rautenbach. Pakathi participated in the //2Weeks residency in June 2017 and the subsequent exhibition *Post-Digital 2016/17* in February 2018 and Daniel Rautenbach participated in the //2Weeks residency in April 2018 and the subsequent exhibition *Post-Digital 2018* in February 2019. I have selected both these artists to analyse and reflect on as they both contributed essays to the publication. Rautenbach’s essay titled *Articulating Content* and Pakathi’s visual essay titled *_lost lover seeks interne(et)al validation* can both be viewed as extensions of their practices carried through from their //2Weeks residencies and their Post-Digital instances.

Pakathi and Rautenbach generated their own content for their //2Weeks residencies and Post-Digital instances. Pakathi was the first artist to use only Instagram Stories as his platform for his //2Weeks residency titled *my weight in grams*. He chose not to integrate his daily check-ins with Instagram timeline posts, focusing on Instagram Stories. Rautenbach created unique algorithms for his own site which housed his //2Weeks residency titled *Content Generator*. Both artists used existing motifs, reflecting and critiquing the behaviours of their selected frameworks, for Pakathi it is Instagram as a site and medium with unique behaviours and for Rautenbach it is the contemporary art world as a site and concept. For both, there exists a “tension between the digital and physical spaces” (Whitaker, “//2Weeks 2016 & 2017 - Description” 183) which emerges during the residencies and is carried through to their Post-Digital instance and their essays.

Pakathi’s //2Weeks residency, *my weight in grams* leverages Instagram Stories as seen in Figure 1. This platform becomes a framework for his practice, a site-specific iterative performance in a public space. He uses this framework as a mode for communicating brief, fleeting and passing moments, which last 24 hours. These moments are thoughts or ideas, responses to the platform and its unique dynamic that Instagram users’ have developed with it. Each iteration is a reflection on how “aspirational validation IG

[Instagram] seeks to imbue its users” (Pakathi, BROOKLYN J). Pakathi plays with the form of the medium (Instagram) using unique behaviours of the application and the digital space to prompt conversations and to critique Instagram as a space. Pakathi’s //2Weeks residency uses tags, likes, notifications, and comments which simulate interactions on the applications and on a user profile to interrogate the space. He grapples with concepts of inclusion, validation and acceptance online as seen in Figure 2.

Pakathi’s Post-Digital instance *my feelings are here, somewhere* for the *Post-Digital IV 2016/17* reflected the performative nature of his //2Weeks residency whilst presenting a static glimpse of a generated contemporary emoji mandala. The use of emojis and references to vapourwave extend the New Aesthetic or post-internet aesthetic which clearly emerged in his //2Weeks residency (Whitaker, “Internet and Post-Internet Art – Floating Between the Two”). The installation, as seen in Figure 3, is a series of three digital printed mandalas hung over a draped iridescent fabric and a light pink wall, creating a meditative space for the viewer to breath, contemplate and pause during the *Post-Digital IV 2016/2017*. His accompanying text highlights his intentions of the work to focus on “notions of emotional healing and mandatory time out to address mental well being” (Whitaker, *Post-Digital 2016/17 Catalogue*). He goes on to refer to the “inventive

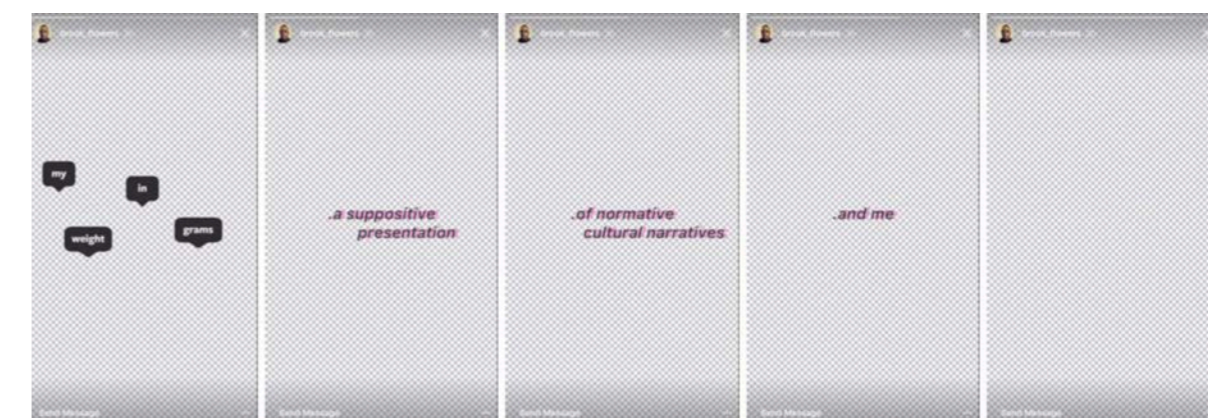


Figure 1. Brooklyn J. Pakathi, *my weight in grams*. Screenshots of Day 1. 2017.

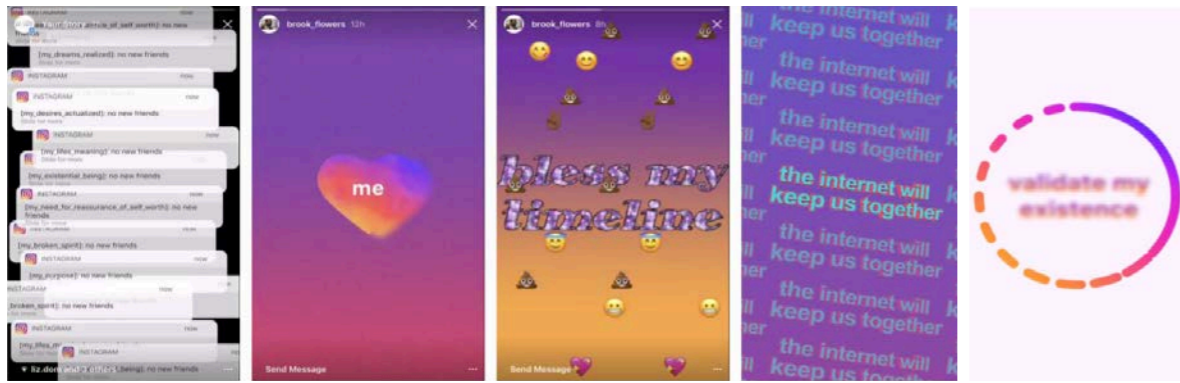


Figure 2. Brooklyn J. Pakathi, *my weight in grams*. Screenshots from selected days. 2017.

process” of creating work and embracing the creative flow of making, “trusting the process of release and recharge” (Whitaker, *Post-Digital 2016/17 Catalogue*). It is as though each mandala becomes an instance of or possibility for this. There is an overlap between the addressing of mental health within a digital context and the creative process or creative flow. Through this installation, Pakathi sets up a vulnerable space for the viewer can choose to engage with on not.

In Pakathi’s visual essay, *_lost lover seeks intern(et)al validation*, he explores the relationship that he has with the screen in three parts, see Figure 4 (Pakathi, “_lost Lover Seeks Intern(et)al Validation” 57–61). It reads as an extension of his residency, further exploring the ideas of validation, inclusion and acceptance online and “between the screen”. The first part, a present exploration of how we exist in relation to the screen, between it, as though we leave part of ourselves online or the screen takes something from us. The screen and digital space are presented as an infinite source, a vulnerable space of revelation. In the second part of his visual essay, Pakathi takes the viewer rhythmically through a spiritual experience, resulting in ‘searching...’. The final, third part, presents a vulnerable emptiness providing the reader with no resolution and a continued state of loading.

Rautenbach’s //2Weeks residency *Content*

Generator when viewed in relation to his Post-Digital instance and his article, becomes his first engagement with concepts around content generation and a critique of it. For the //2Weeks residency, Rautenbach developed an algorithm to help him generate content, viewed as artworks. This algorithm becomes a curatorial mechanism, automatic his creative practice through constraints and limitations. The algorithm enables him to generate a concept, a medium and application, which he uses as constraints for his artistic process and as the artist then creates the artwork based on what the algorithm has generated. He as the artist then becomes a content generator. This process not only critiques the artmaking or creative process, but starts to question the art market and the content creation market. By the end of the two weeks, Rautenbach had generated an exhibition, although it wasn’t presented this way, through his constraints using an algorithm he has a body of work. The type of work generated exists between the art world, digital culture, branding and advertising – all of which engage with material possession and acquisition, see Figure 5.

In Rautenbach’s Post-Digital instance *Own Your Content* presented for the *Post-Digital V 2018*, he sets up a manifesto and begins to critically engage with how we are situated in and amongst this content. The video manifesto is presented on a portrait screen, continuing his //2Weeks residency aesthetic presented on fake grass against a clean

gallery wall, see Figure 6. His video, a textual exploration, critiques the generation of content in our contemporary popular and digital culture. It focusses on access, privacy and data concerns, encouraging the viewer to “pause and contemplate their own content and position in relation to content that they receive or are exposed to” (Whitaker, “Post-Digital V 2018 - Curatorial Notes” 263). *Own Your Content* solidifies his argument set up in *Content Generator* and responds critically to his own acts.

In his essay *Articulating Content* Rautenbach comes full circle and expands on the origins and meaning behind contemporary content, see Figure 7. He states:

We write about consuming content, but what we often don’t realise is that we are driven to ‘produce content’ in every small action we do—whether it’s online, where we are monitored by algorithms to track our



Figure 3. Brooklyn J. Pakathi, *my feelings are here, somewhere*. *Post-Digital IV 2016/17*. 2018.

movements and targeted for further advertising, or we are out in the ‘real world’ thinking about how we can present and brand ourselves for more productivity. (Rautenbach 47)

This acknowledgement that content generation exists online through our own actions and through how we implement or present ourselves in a physical context is insightful

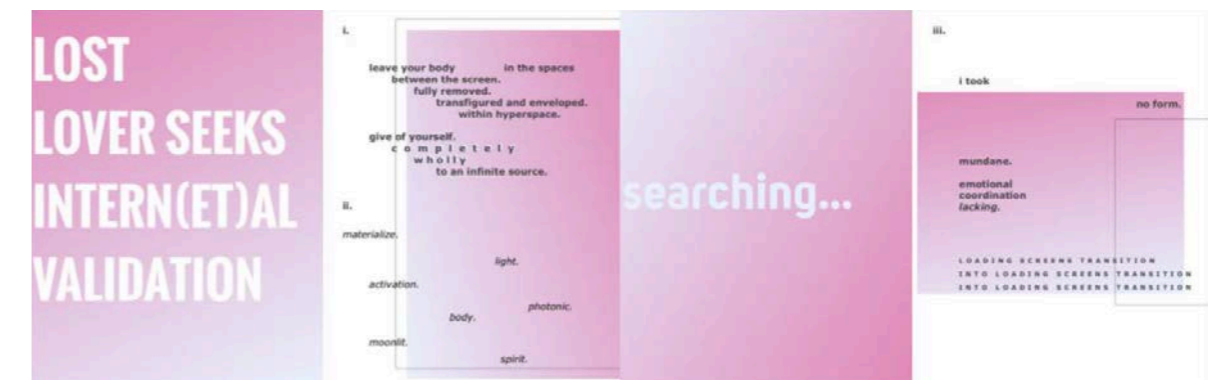


Figure 4. Brooklyn J. Pakathi, *_lost lover seeks intern(et)al validation*. 2019

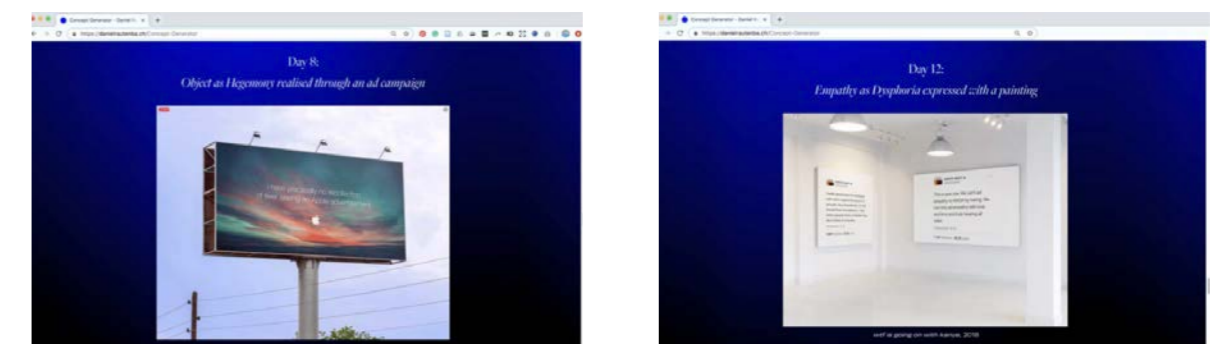


Figure 5. Daniel Rautenbach, *Content Generator*. Screenshots from selected days. 2018



Figure 6. Daniel Rautenbach, *Own Your Content*. Post-Digital V 2018. 2019

and leaves *Content Generator* and *Own Your Content* surrounded by more questions.

Conclusion

This paper forms part of a bigger research investigation I am doing on the relationship between the digital and physical art making practices that are emerging from and through *Floating Reverie*. I am interested in defining the role of the artist and curator as these spaces and contexts challenge how they act. The analysis of Pakathi and Rautenbach's //2Weeks residency, Post-Digital instance and article reveals how the artist both delve deeper into their own practices and continue to develop the performativity which was established progressively in their //2Weeks residencies (Whitaker, *Floating Reverie*

5 Years 2014 - 2019 81). Pakathi habitually posts in a similar vein to checking Instagram and watching stories, exploring within the space itself and exposing its vulnerable tendencies - directly commenting on our online behaviour. Rautenbach develops a "chronological archive of actions and digital objects" (Whitaker, "//2Weeks 2014 - Description" 81) both for himself and the viewer automating a creative practice through generative curatorial mechanisms. Pakathi almost does the antithesis of this through ensuring that the digital objects created are ephemeral and no longer accessible. His residency only exists as documentation through an archive. Both Pakathi and Rautenbach challenge how we perceive artworks, the idea of a concept, and the creative art making process. Habitual automation enables both artists to create a digital body of work. Through the engagement with specific patterns and tendencies that have emerged in both the selected artists' practices located in the their //2weeks residency, Post-Digital instances and their articles, and connecting the digital and physical space which *Floating Reverie* occupies has been established.



Figure 7. Daniel Rautenbach, *Articulating Content*. 2019.

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Abstract

Dealing with the intermedial performative practice of dancing with VR technology, in this account I frame the creative media of VR technology and bodily performance as epistemological media, in which we can be immersed but also develop reflective awareness to the processes of leading visions and movements. The account follows the interdisciplinary and intermedial practice-based research experiment 'Playing with Virtual Realities' (gamlab.berlin, Humboldt University of Berlin). The project brought together two dancers, a philosopher/choreographer, two theatre scholars/dramaturges, two computer scientists/gamers, and two media experience designers to co-explore how the embodied practice of dancing can interact with HTC Vive, a virtual reality headset developed by HTC and Valve Corporation. At the outset, the experience of moving within VR technology interrupts the perceptual processes in dance, and throws embodied thinkers into a dualist – Cartesian – state of mind, in which visions, actions, and thoughts are disconnected from the sensual body. In this account, I demonstrate how, by using cross over methods from media experience design and choreography, we composed a physical performance in which the dancers learned to assimilate awareness to the actual space, to their dancing partner, and to the audience, while negotiating their immersive experience within the virtual environment.

Keywords: performance in VR; dancing in VR; Dance; Interdisciplinary research; Practice-based research; Dance philosophy; Performance philosophy

For performance trailer: <https://www.youtube.com/watch?v=g9Un6TDYyE4>

For research trailer: <https://www.youtube.com/watch?v=YcGdKuUhmF4>

PLAYING WITH VIRTUAL REALITIES: NAVIGATING IMMERSION WITHIN DIVERSE ENVIRONMENTS**Introduction**

In 'How We Think', the American pragmatist John Dewey describes knowledge as artificial and thinking as a skill (1910). As he portrays it, our thoughts are designed modifications upon the natural order of things: when we think, we put things in order and create relationships and continuity between them. By designating thinking as an artificial apparatus, Dewey does not mean that our thoughts are factious or unreal. Rather, he invites us to view the word 'artificial' as associated 'with the idea of art, or expert skill gained through voluntary apprenticeship' (Dewey 1910: 56-7). His description emphasizes the cultural value of knowledge gained through thinking since our artificial knowledge-systems advance the possibility of foresight. Yet, he stresses the contingency of our thoughts – in relation to the processes, the orientation and the contexts of their production. Processes of realization might be truthful or not. A failing might happen if while being immersed in our explanations we have 'false notions of concrete and abstract.' In this case, a thinker misconstrues judgements as sense perceptions (Dewey 1910: 135). As he stresses: '[a]ctually, all dealing with things, even the child's, is immersed in inferences; things are clothed by the suggestions they arouse, and are significant as challenges to interpretation or as evidences to substantiate a belief' (Dewey 1910: 135). For that reason, in 'How We Think' Dewey emphasizes the need for training reflective thinking. Through reflection we start to notice how we think, and the contextuality, relevance and significance of our knowledge becomes clearer. Dealing with the intermedial performative practice of dancing with VR technology, I ask you to view the creative media of VR technology and bodily performance as artificial apparatus, in which we can both be immersed and

develop reflective awareness to the alchemy of leading our visions and movements.

In 2017-2018 I directed and choreographed the practice-based research experiment 'Playing with Virtual Realities' as part of my postdoctoral fellowship at the excellence cluster 'Image, Knowledge, Gestaltug – an Interdisciplinary Laboratory at Humboldt University of Berlin' (Katan-Schmid 2019). The Interdisciplinary Laboratory clustered representatives from more than 40 different disciplines, who were collaborating in fundamental design processes and co-explored imaging and knowledge production as creative practices. One of the research foci of the Interdisciplinary Laboratory was to investigate how imaging influences perception, thinking and action. In 'Playing with Virtual Realities' we explored the relationship between imaging and activity, via challenging the movement habits of dancers and asking them to dance in a virtual environment. The initial outlook, which was leading the project, is that dancers enact movement by following embodied imageries (Fischer 2017; Katan-Schmid 2017). In my philosophical research I deal with dancing as a creative process of realization – one in which images, metaphors, scores, or any other conceptual, cultural and technical understanding of spatiality are explored, embodied and brought into sensual existence. By putting dancers in a virtual environment, we wanted to explore what happens if the imageries dancers relate to are really present in front of their eyes. The motivation for the research was to explore our media as platforms for knowledge production. We related dancing as a form for embodied thinking and VR technology as a medium for immersive exploration. By using VR technology as a metaphor for virtual vision that is provoked by technology, we

associated the notion of 'virtual reality' with the symbolic order (or epistemology) provoked by our techniques of knowing, among them the techniques of the body (Mauss 1994;1934). Eventually, the project brought together two dancers, a philosopher/choreographer, two theatre scholars/dramaturges, two computer scientists/gamers, and two media experience designers to co-explore how the embodied practice of dancing can interact with HTC Vive, a virtual reality headset developed by HTC and Valve Corporation. As part of the research we developed a movement practice for moving in relation to both the virtual and the actual environments. We composed physical performance, in which the dancers learned to assimilate awareness to the actual space, to a dancing partner, and to the audience, while negotiating their immersive experiences within the virtual environment. The VR applications we used for designing our composition were Tilt Brush by Google, Masterpiece VR by I-Illusions, and the arcade game Space Pirate Trainer by I-Illusions.

At the outset, moving in VR technology interrupts the dancers' somatic awareness. While dancing dancers tend to integrate attentiveness to their bodily feelings in order to complete their movements. Staging dancers in VR is a challenge for their artistic perception since the VR setting converts the experience of how dancers normally lead their dance. While moving within a virtual environment there is a disruption and discontinuity between what the dancers see and how they feel their bodies. Thus, at first, it might seem that VR technology throws embodied thinkers into a dualist – Cartesian – state of mind, in which visions, actions, and thoughts are disconnected from the sensual body. For example, in the drawing applications Tilt Brush and Masterpiece VR, the users draw with handheld controllers in 3D space: the movements of the controllers become brush strokes, so the imagination of the artist gains a virtual form and the users become absorbed in their own creative process within the virtual environment

and tend to be oblivious to their sensing within the actual space, in which their body exists.

The idea of using the drawing applications followed William Forsythe's CD-ROM publication 'Improvisation Technologies: A Tool for the Analytical Dance Eye' (Forsythe & Haffner, 2012) and the research project 'Motion Bank' (deLahunta & Hennermann 2013). In 'Improvisation Technologies', Forsythe explains his method of improvisation. The imageries he describes in words and demonstrates in movements are annotated, so the viewer can witness the precision of his bodily movements in relation to the score of the dance. 'Motion Bank' is a bank of online digital scores which were created in collaboration with leading choreographers with diverse movement approaches, like Forsythe and Deborah Hay. In both projects the score of the movement gains a digital graphic shape. In 'Improvisation Technology' and in 'Motion Bank', however, the score of the dance is created by digital artists, who interpret the choreographic instructions and the movements of the dancers, so the dancers can be oblivious to the score as an external entity to their bodies and imagination. While dancing, they lead their dance systematically according to their techniques and their comprehensive methods of negotiating imageries as bodily feelings. Withal, by using 'Tilt Brush' the dancers are confronted, while moving, with an external image, which is created by their very movements and represents them.

In 'Playing with Virtual Realities' we found this disruptive for two opposing reasons. During the first rehearsals, the dancer Lisanne Goodhue could not relate the virtual representations and her dance at the same time. Goodhue described her experience in VR as fragmented – she could either draw or dance. She could not bridge the two experiences immediately and intuitively into one comprehensive practice. To the contrary, the dancer Nitsan Margalio tended to integrate the score immediately into his dance, to be carried away by it and to identify it, as he reported,

with his own imagination. At times, Margalio became aware of the limits of the score and felt as if he was stuck in his own movement patterns, as if his own imagination was limiting him, rather than the digital representation. This feeling of identification, between the virtual representation and his own imagination, caused frustration which interrupted his experience. Thus, the problems we faced were either a feeling of discontinuity between the virtual environment and the experience of dancing, or a feeling of lack of methodical and emotional distance between imageries and bodily feelings, which seemed to us necessary for liberating curiosity and releasing the flow of embodied imagination.

Furthermore, within the experience of dancing in actual environments dancers normally follow both their imagination and their visual perception. They enact sensory information with imageries, embody them and bring them into actual life, according to – inter alia – environmental and physical understanding. If I want to perform a grand jeté, I direct my landing in the room; if I perform a pirouette, I keep a focal point while spinning. The perceptual affordance of the actual environment enables a feeling of physical trust and competency, since sensory information inputs from the different senses are continuous (Gibson 1975). As a dancer I can direct my grip, my jump, and my expression as a gestalt between my actual perception, imagination and technique. However, while using the VR headset, the users cannot see their bodies. Thus, the usual gestalt dancers are used to lead and follow is converted and interrupted. In addition, if there are spatial obstacles like a wall, furniture, or another person, the immersed user might run into them. Dancers, who are used to rely upon their vision to perceive spatial relationships, try to keep in mind where they are moving in relation to the physical space, and often lose orientation. In our experiment the dancers became aware to the distance between the environments – the virtual and the actual. The division between the realms affected their trust. The awareness to

the gap between the spaces and to the multi-layered information accelerated, as Goodhue described it, a 'fragmented experience'. Moreover, the feeling of fragmentation disoriented the dancers emotionally, as well. In the first rehearsals, Goodhue reported that, while normally she would feel indifferent to being watched while dancing, the lack of trust she felt within the virtual environment triggered an inconvenient feeling of self-consciousness. Margalio testified that moments of rivalry between the environments provoked in him frustration and a feeling of incompetence.

Another layer of disruption for dancers who are moving within a VR setting and lose full awareness to their physicality, is their limitation in designing a creative choice-making. While moving in a virtual world, experiencers follow the media design of the VR. In 'Space Pirate Trainer', for instance, gamers fight off relentless waves of droids, shielding themselves with handheld controllers while shooting back. The gamers' movements follow solely the VR setting, so they become oblivious to the physical space. In addition, the VR setting of 'Space Pirate Trainer' is highly immersive. While experiencing and rehearsing, it was often difficult to communicate with Margalio, who wanted to win the next points in the game. As the media experience designer Sabiha Ghellal, who contributed the research and creative process, distinguished: in 'Tilt Brush' the experience was too ambiguous for the dancers, while the dancers' choices in 'Space Pirate Trainer' were too prescribed by the game (Ghellal, 2017). Beyond the psychological challenge for balancing an experience for users, which is the emphasis of media experience designers, if the dancers could not perform clear decision making, it dislocated their performance from being a creative endeavour. The dancers who are immersed in the virtual realm become too occupied with the virtual vision and do not lead their movements in relation to a composed information. Consequently, although Margalio's physical movements were more athletic than

the movements of typical gamers, when he was merely following the experience design in 'Space Pirate Trainer', we found his performance unexciting to watch. It seemed that, being immersed in his experience, his movements could not be recognized by us as artistic expression. In 'Art as Experience', Dewey defines expression as an excitement without discharge:

to discharge is to get rid of, to dismiss. To express is to stay by, to carry forward in development, to work out to completion [...] where there is no administration of objective conditions, no shaping of materials in the interest of embodying the excitement, there is no expression (Dewey 1980 & 1934: 64).

As we defined it in our research, playing a physical game was not enough for the dance to be an artistic utterance, we needed the dancers to be leading agents, who altogether sense, direct and comprehend the experience they undergo.

The choreographic endeavour in 'Playing with Virtual Realities' needed to assimilate considerations from both dance-knowledge, dramaturgy and media experience design. We looked to provide the dancers with reasons to interact with diverse information in both environments, while both reciprocating with a dancer in another realm and articulating experience for the audience. We used a beamer projection on the wall upstage, which exposed the point of view of the dancer inside the VR. The projection of the viewpoint in VR was staged to unfold the perspectives and the exchange between the two dancers. For example, in the first scene a computer voice – representing (a fake) artificial intelligence – introduced the technology to Margalio. When the beamer projection turned on, the AI voice said: 'let's see what you see'. By that, we staged the connection between the beamer projection to the dancer's perspective. In another scene, Margalio shared his experience with Goodhue, and before they exchanged the headset, he asked her whether

she wanted to see what he sees. Additionally, we staged the differences between the virtual and the physical spaces, deconstructed the experience design in the VR applications, and then created a continuity and correspondences between both realms. For example, in the first scene, using Masterpiece VR, Margalio pointed out the limits of his virtual environment. Accordingly, Norbert Schröck, a computer scientist, gamer, technician and researcher in the project, marked the limits of the virtual environment in physical space. Additionally, in the opening scene Margalio and Goodhue moved in parallel spaces: while Goodhue was outside of the VR and followed a method of room drawing from Forsythe's 'Improvisation Technologies', Margalio wore the headset and drew with the controllers in the virtual room. From a dramaturgical point of view, this scene enabled us to articulate the analogy between following a score while dancing and drawing in 3D space. Later on, we deconstructed the experience design in 'Tilt Brush'. One dancer wore the headset, while the other dancer drew scores with the controllers. The dancer who wore the headset and was absorbed in the virtual realm, replied to the drawings as if they were metaphoric choreographic instructions. We associated the haptic-like texture of brush strokes and their positions in space with sensual feelings: thus, the dancer inside the VR embodied the score. The role of metaphors in contributing immersive experiences and bodily presence was explored as a cross-over method in both experience design and choreography. While experience designers use metaphoric concepts, which direct users how to behave in digital environments (Murray 1997: 106), in choreography metaphoric instructions are often used to embody a new physical understanding. When I instructed the dancers how to move by using dance metaphors – a common occurrence in Gaga, Ohad Naharin's movement research (Katan-Schmid 2016: 65-76) – Ghellal looked for comprehensive metaphors which may reflect the bodily experience of the dancers, among the drawing possibilities in 'Tilt Brush'. The

crossover metaphors in the virtual realm and in the dancers' bodies provided the dancers with a reason to follow the virtual space, while generating the impression that the virtual realm is an expression of their inner world. In the last scene we layered the information between the environments and staged the virtual environment on the actual theatre stage. Goodhue designed the virtual room with bubbles from the palette in 'Tilt Brush', while embodying the bubbles as if they were running inside her flesh. At the same time, Margalio filled the actual stage with soap bubbles, and mirrored Goodhue's expression, as if he was learning and connecting with her inner world. This scene continued with a unison, to express the communication and empathy between agencies moving within different environments. Later on, a child performer (Aurica Mosse) came from the audience, entered the virtual realm and embodied the digital bubbles with her performance, while the spectators entered the stage and filled the actual environment with soap bubbles. The divisions between actual and virtual worlds, as well as between performers and spectators were finally merged into a multi-layered, yet continuous, experience. The spectators, who supported the child, seemed as if they were staying by and carrying forward a development of the girl's vision. By that, the audience took part in articulating her expression.

Immersive experience is a mirage, which is not developed without comprehensive and systematic administration. In 'The Theatre and its Double' Antonine Artaud defines the mirage of artistic symbols as 'virtual reality':

All true alchemists know that the alchemical symbol is a mirage as the theatre is a mirage. And this perpetual allusion to the materials and the principle of the theatre found in almost all alchemical books should be understood as the expression of an identity (of which alchemists are extremely aware) existing between the world in which the characters, objects, images, and in a general way all that constitutes the virtual



[photo 1: Nitsan Margalio interacts with Space Pirate Trainer. Screen-shoot from documentation by Harumi Terayama]



[photo 2: Lianne Goodhue and Nitsan Margalio communicate while experiencing Tilt Brush by Google. Screen-shoot from documentation by Harumi Terayama]



[photos 3&4: The virtual vision of Aurica Mosse is supported by the audience. Screen-shoot from documentation by Harumi Terayama]

reality of the theatre develops, and the purely fictitious and illusory world in which the symbols of alchemy are evolved. (Artaud, 1958: 48)

The creative endeavour of the performing arts includes a process of embodying a reality, which is not there in advance. The 'virtual reality' of dancing comes into life when imageries and ideas become movements, feelings and sensations. The feeling of presence in dance signifies a continuous experience within correlation of body and mind. Nevertheless, despite being a mirage, in participatory media, like performance, immersion is also a reflective labor. In 'Hamlet on the Holodeck', Janet Murray writes: 'in a participatory medium, immersion implies learning to swim, to do the things that the new environment makes possible' (1997: 99). As Murray indicates immersion, it is a metaphorical term for a psychological response to an exceptional, intense, and ultimately transformative experience of 'diving into' a new environment (Murray 1997: 98-99). At the same time, 'diving into' implies creative attunement; 'we do not suspend disbelief so much as we actively create belief' (Murray 1997: 110). In performance and in VR technology, the creative labor of designing immersion seek to integrate sensory perception, intentionality and skill. Both in performance and in VR technology we ask to deliever an artificial world of continuous identity between all experiential elements – we create worlds of 'make believe'. Nevertheless, returning to Dewey, in 'How We Think' he stresses that despite the artificiality of our knowledge production, our knowledge is not necessarily factious or unreal. Virtual reality is also a reality and it has the positive potential to ease our living. Furthermore, both performance and VR technology are chances for developing reflective thinking. By exploring the alchemy of perception, through their media of design, we also generate a chance for observing immersion, while being immersed. As Bertolt Brecht stresses the dialectic of distancing in performance: '[i]f one has learned to think dialectically one can find it possible that a technique which is taken

from the realm of magic can be used to combat magic with' (Brecht, 1961: 134). By exploring our media of thinking we learn how to maintain a mental and reflective distance to our knowledge production, while undergoing it. The potential of this dialectics is within the possibility of comprehending our knowledge in context.

The intermedial and interdisciplinary exploration in 'Playing with Virtual Realities' forces us to reflect our knowledge-production, in order to find out why our knowledge 'make sense' and how it can be adjusted, when we face other knowledge-systems and environments. In our practice, we needed to create a new method for exchanging between sensory-information and virtual visions. We generated a new immersive exchange by defining the relationship between visions and sensations as analogous metaphors. As a result, the aesthetic labor of the dancers could emphasize the embodiment of this relationship, while being aware to the alchemy of their dance. On the day of the premiere, Goodhue told me she felt she was dancing the same as always, that she did not convert her dance into a new skill. This statement, as I understand it, demonstrates that eventually Goodhue could swim effortlessly within the mixed environments. Nevertheless, the choreography, the experience design, the dramaturgy and the dancing had to press out the relationships between the realms, between the players, and between performers and spectators, in order to 'create belief' and to facilitate for all participants an easy navigation between diverse realities. As an interdisciplinary and intermedial project, 'Playing with Virtual Realities' dealt with a variety of know-hows – the VR technology, media experience design, dramaturgy, choreography, philosophies and the embodied techniques of the dancers among them. We needed to play with our knowledge-systems and with our habits to produce immersive explanatory relationships between diverse environments and to emphasize how they could coexist and intertwine. As Dewey describes thinking, we needed to put things in order and

to create relationship and continuity between them (Dewey 1910: 56). Immersion is the proof that our methodical practice 'made-sense', which generates a comprehensive meaning and a comfort within a multifaceted world. Our practices, knowledge-systems, methods, and skills are techniques for generating a feeling of competence. Nevertheless, they are artificial and cultural. When we put our knowledge in intermedial encounter, or in a setting, in which 'make believe' is within awareness, we learn to reflect, observe and value the alchemy within embodied processes of realization.

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Dancers-researchers: Lisanne

Goodhue and Nitsan Margalio

Child performer: Aurica Mosse

Technical assistance-researchers: Meik

Ramey and Norbert Schröck

Creative team-researchers: Sabiha Ghellal,

Ramona Mosse, Christian Stein and Thomas Lilge

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Abstract

The information that was generated by the National Inventory of Historic Quarries project associated with the Architectural Heritage of Extremadura, developed by IGME, Instituto Geológico y Minero de España (The Geological and Mining Institute of Spain), such as, geological maps, petrographic studies, rock samples, photographic archives, etc., constitutes the documentary foundation of the artistic work: *Petrographic field guide*, by visual artist Rosell Meseguer. *Guía de mano (petrográfica) or Petrographic field guide*, was exhibited at the Vostell Malpartida Museum, Cáceres, as part of a public space art project called Cáceres Abierto, 2019. It reflects the enormous scientific potential, not only of these types of projects, but also as an Earth Sciences disseminator. The Petrographic field guide focused on the studies of the rocks used for building the Vostell Malpartida Museum, located in Los Barruecos (Cáceres, Spain). The museum was originally an old wool laundry; granite rocks from its surroundings were used for its construction. The building sits on a quarry; the rocks used for its construction are part of the quarry itself. The studies identified natural areas in front of rocks cut for architectural use, as a metaphor for artificial nature, stone extraction and relocation.

Keywords: contemporary multi-disciplinary art, geology, digital photography, divulgation

PETROGRAPHIC FIELD GUIDE

Introduction

Since 2018, I have collaborated with the IGME (Instituto Geológico Minero de España), to obtain materials related to the Cáceres quarries in the area. All these quarries are approximately 10 km west of the city of Cáceres, in Extremadura, Spain; they are crags, rocks scattered throughout the length and breadth of the landscape. The collaboration provided me with photographs of the area, detailed geological maps and a series of tests related to the visual structure of the rocks.

This geological collaboration was the basis of my personal art project: *Petrographic field guide* (Meseguer, R. 2019) exhibited between April 25 and June 16, 2019 in the contemporary art and culture program Cáceres Open 2019. It aimed to encourage a necessary reflection on the architectural use of the stone and the natural aesthetic value of the material itself, through a series of works and installations in the exhibition space of the Museum of Cáceres and in the Museo (Wolf) Vostell Malpartida, located in Los Barruecos, Cáceres. It introduced the general public to the results obtained in the National Inventory of Historical Quarries project associated with the Architectural Heritage (IGME), the artistic and aesthetic value of the stone from which our architectural heritage is constructed. (Fig. 2).

The Vostell Museum was a former wool laundry and its site serves as a reference for the use of the rock and native stone in the region. It involves porphyry granite quarries used for the construction of the laundry. What particularly interests me is that the Museum is located on the quarry site; natural areas are exhibited in contrast with the rocks "cut" and "split" for architectural use as a metaphor of artificial nature, stone extraction and its relocation.

My project expands the research based on the petrographic analysis of the area, where petrographic and textural aspects of rock are unified, which makes it possible to correlate samples between the quarry and the building; this research shows how the laundry (and hence, part of the Museum) as well as other buildings of the province of Cáceres were built with rock from the area.

Results

Origin of the rocks studied

In some cases, the rocks that constitute the historical constructions, mostly granites, were photographed showing an unaltered natural surface and a patina, of lichen, while others were cut, reflecting the contrast between altered and healthy surfaces, and also their "soul", their microscopic appearance, with numerous microphotographs of petrographic samples, among other documentation such as maps and cartography in detail, photographic archives.

The INCHaPA Extremadura project correlated the selected samples in the buildings with the samples taken in the quarries, comparing textural and petrographic aspects (Alvarez Areces, 2018). As an example, the exhibition space of the Vostell Malpartida Museum, a former wool laundry built in the Barruecos (Cáceres), used the most accessible materials in its construction, biotitic moscovitic granites with megacrystals of feldspars, which constitute all the factories of this historic site converted into a museum in 1976 (Fig. 3).

The rock used at the construction of the Vostell Malpartida museum

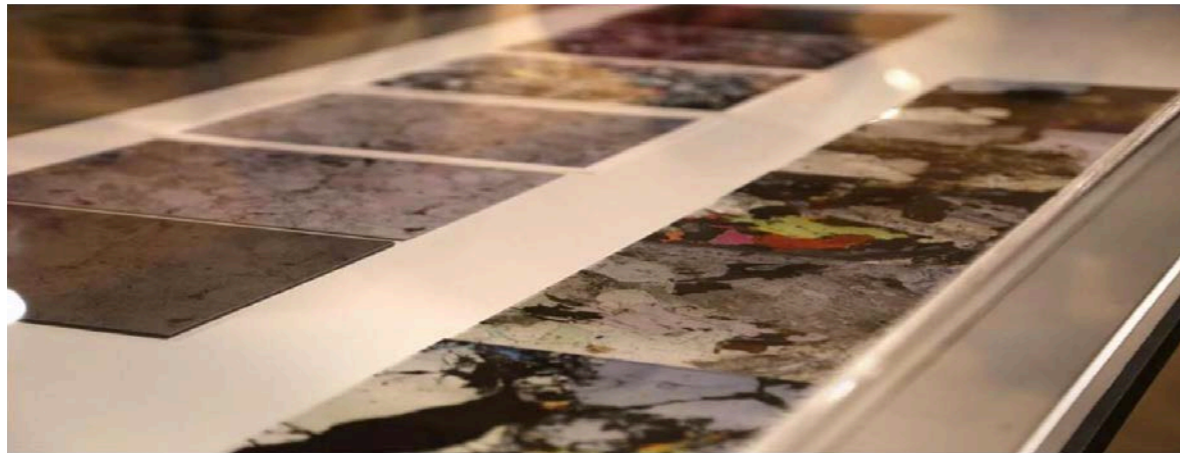


Figure 1. Exhibition Petrographic field guide (Meseguer, 2019) at Museo Vostell Malpartida, Cáceres, Spain; Contemporary Art and Culture Program Cáceres Abierto 2019

The Vostell Malpartida museum is arranged on the same granitic outcrop with which it was built, so that the building sits on the quarry itself, contrasting natural areas with rocks cut for architectural use, as if it were a metaphor for artificial nature, extraction of the stone and dislocation of it.

The exhibition at the Vostell Malpartida museum

In the Mill Room of the Vostell Museum itself and in the Museum of Cáceres, I presented different rock samples related to the construction of the historical buildings. I photographed the samples at both macro. and micro scales, selecting a series of cuts to show the differences between fresh and altered surface. These series of works, along with others related to the INCHaPA Extremadura project, such as maps and detail maps of quarry spaces, photographic archives, thin sheets for its petrographic study, etc., were part of the exhibition project (Fig. 4).

Additionally, cut blocks related to the heritage and local quarries of Malpartida de Cáceres and the Barruecos (Fig. 5), as well as stone samples of quarries of Trujillo, a city declared a Historic Site since 1962, completed the exhibition.

The publication: Petrographic field guide

The information I gathered was published in a work-guide pamphlet (print on paper), in which the different textures photographed with a microscope and a good representation of the exposed stone compositions are highlighted. The *Petrographic field guide* was published by Consejería de Cultura e Igualdad, Junta de Extremadura, with the collaboration of Vostell Malpartida Museum, Helga de Alvear Foundation and Cáceres Museum.

Figures, Tables and Schemes

Figure 1. Exhibition Petrographic field guide (Meseguer, 2019) at Museo Vostell Malpartida, Cáceres, Spain; Contemporary Art and Culture Program Cáceres Abierto 2019

Figure 2. Interior image of the publication: Petrographic field guide (Meseguer, 2019) presented at the Contemporary Art and Culture Program Cáceres Abierto 2019. The image shows a natural granite rock photograph from Cáceres, and photographs taken from the granite rock with a microscope.

Figure 3. Vostell Museum and Quarry, in which the art pieces and publication of the project by Rosell Meseguer was showed. Cáceres Abierto 2019



Figure 2. Interior image of the publication: Petrographic field guide (Meseguer, 2019) presented at the Contemporary Art and Culture Program Cáceres Abierto 2019. The image shows a natural granite rock photograph from Cáceres, and photographs taken from the granite rock with a microscope.

Figure 4. Different microscopic stone samples, digital photography on transparent layers by Rosell Meseguer at Museo Vostell Malpartida, Cáceres Abierto 2019

Figure 5. Trujillo stone composition by Rosell Meseguer at Museo Vostell Malpartida, Cáceres Abierto 2019

Figure 6. Disclosure document, Petrographic field guide Cáceres Abierto 2019



Figure 3. Vostell Museum and Quarry, in which the art pieces and publication of the project by Rosell Meseguer was showed. Cáceres Abierto 2019

Discussion

The hand guide (petrographic) work aims to highlight the many formal aspects of defunct quarry spaces present. Regardless of their scientific-technical, historical, archaeological, etc. interest, these extractive areas constitute unusual landscapes, in which time has stopped, and through contemplation we can go back to that moment when extraction activity was fully active.

In addition, the aesthetic value of natural stone as a raw material used in the constructions since the early days of humanity is especially relevant to this exhibition, bringing the general public closer to the intrinsic characteristics of the stone, its origin and use in the architecture of local heritage, relating it to the spaces of historical

quarries that in many cases are unknown or have simply fallen into oblivion (Fig. 6).

Materials and Methods

Quarry spaces are unique landscapes that demonstrate how territorial and social contexts overlap, allowing to know the type of rock and the geological formation benefited, processing sites and stone workshops, transport systems, purpose and use of the material, as well as the human means, foresight and structures related to the habitat. The *Petrographic field guide project* (art pieces and publication), wants to highlight these aspects.

At present time, the quarries are not considered 'heritage sites' in the strictest sense of the term, hence IGME is carrying out a specific

project, to understand their importance and reach agreements between industrial interests (extraction of stone with industrial or daily uses) and the need to protect quarries that are essential to the reconstruction of specific historical buildings. Historical quarries, in exceptional cases have become Goods of Cultural Interest or have been protected under different legislative actions, both locally and regionally, ensuring the preservation of certain sites (Alvarez Areces et al., 2017). In this context it becomes necessary and much more effective the unification of criteria and a specific protection figure that guarantees their conservation and the purpose with which they were created, in the case of requiring stone material for future heritage interventions (Baltuille et al., 2016). Taking into account that there are different types of quarries, taking into account their dimensions (monumentality), extractive techniques used, uniqueness of the stone material exploited, etc.

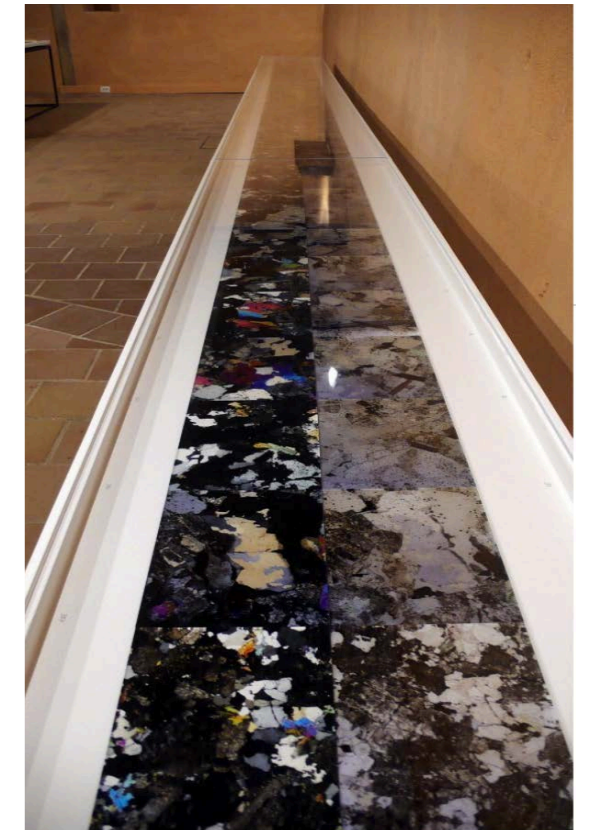


Figure 4. Different microscopic stone samples, digital photography on transparent layers by Rosell Meseguer at Museo Vostell Malpartida, Cáceres Abierto 2019



Figure 5. Trujillo stone composition by Rosell Meseguer at Museo Vostell Malpartida, Cáceres Abierto 2019

Conclusions

Nowadays, collaboration between the arts and industry and science sectors is essential. In this project, the collaboration between myself as an artist, and geologist, was beneficial for both parties.

Multidisciplinary art projects illuminate the world that we have built around us, giving meaning to the contradictions between technological development and sustainability.

Scientific research, as in the case of the National Inventory of Historical Quarries project associated with the Architectural Heritage led by the Geological and Mining Institute of Spain (IGME), presents a great scientific-technical interest, but when science is formulated with art, research not only has disciplinary value, but is also able to inspire and bring society closer to the formation of a scientific culture.

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www.rosellmeseguer.com



Figure 6. Disclosure document, Petrographic field guide Cáceres Abierto 2019

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Abstract

The Transeuntis Mundi Project is an artistic project that combines a transmedia creative practice mediated by emerging technologies and supported by the processes of artistic research. This article presents and contextualize its creation - the scope, origin and methodology of work. Its experience is designed to happen in a virtual reality environment using 3D technology on sound and video in order to promote immersion and interactivity. We aim to get as close as possible to an experience of traveling and interacting with a certain time, space, culture and people. The power of an interactive application, 360° image and the spatialized ambisonic sound - which responds to the visitor's decision - are crucial for this artistic experience.

Keywords: virtual reality; immersion; 3D; legacy; migration; composition; mobility; walkscape; installation; creative practice;

THE TRANSEUNTIS MUNDI PROJECT: AN IMMERSION INTO HUMAN CULTURAL HERITAGE

Introduction

An old Greek myth relates that Pigmalion, King of Cyprus, made a sculpture in which he represented his ideal of perfect woman. Such was his obsession for his creation that he named it Galatea and he ended up falling madly in love with her. The goddess Venus, at Pigmalion's pleas, turned the cold material of the sculptural creation into flesh and blood.

This ancient story presents one of the most cherished expectations of art: the transformation of representation into real experience. This search that can be traced in the history of art through the evolution of devices, techniques, and media; trying to achieve what we could define today as a radical immersion, capable of transferring the "real" experience, mediated by a device with the power to be transparent and thus achieve the immersion effect.

The artistic project *Transeuntis Mundi* (TM) is located in a continuity line of the search proposed by Pigmalion, inviting its spectators to make a shared trip.

The TM Project proposes to capture the sound and visual memory of peoples, cultures and cities to tell the story of the millennial passersby that have been crossing the world. In this way, it currently portrays diversity, mobility and generates an archive of human cultural heritage to be watched nowadays and by future generations.

It is a creative practice about how mobility through space and time has created geographies and the actual transcultural and transnational humanity. It evokes the power of ancestry, identity and legacy by presenting a piece of new technology art, powered by 3D audio and virtual reality, projections,

sound sculptures and performative actions - which we call a transmedia creation.

Origin

This project began in Medellín (Colombia) in 2005 under the name of "Transeuntis Medellín" (www.transeuntismedellin.com), created by the Colombian photographer and researcher Dr. Gabriel Mário Velez. The project started with an archive of images of the endemic practice in Latin America known as "Photocinería", whose conditions of its accomplishment and historical moment correspond to a period between 1950 and 1980 of the 20th century, with particular development in Colombia. This archive of more than 600,000 35mm negative images of pedestrians and streets in downtown Medellín generated artistic works from the field of visual arts and performance, in addition to its website, which has possibilities of interaction with the public.

In action since 2005, when the project won funding from the City of Medellín to carry out a part of its investigation and identification of its archives, it generated a work called "minimal stories of anonymous passerby." In 2007 it was set up as a research project of the Faculty of Arts of the University of Antioquia and has been producing works, installations, articles, conferences, exhibitions and presentations in different cities of the world such as Havana (Cuba), Buenos Aires (Argentina), and in events linked to the arts and historical and cultural memory.

Artistic Research

In 2018, the project "Transeuntis Medellín" partnered with the research developed under

the Ph.D. in Arts “DNArchive Project” (www.dnarchiveproject.com) by the Brazilian artist and researcher Cândida Borges, held at the University of Plymouth (England). As a concept, this research approaches the genetic memory given by the migration of the human being through geography and times as materials for sonic/imagery/ performative composition. It includes a special focus on cultural aspects resulting from the diasporas that have reached the Americas.

From this partnership, the “Transeuntis Mundi” Project was created. It encompasses the local artistic practice of the “Transeuntis Medellín” project with the methodology and conceptual body of the DNArchive Project, in order to expand its activities to other cities in the world and develop a new transmedia practice and composition based on emerging technology.

Migration and transmedia practice

Human beings have always moved around the world as an on-going migration practice. In ancient times, humans were nomadic, traveling in search of food, shelter and safety. Mobility, as the impulse behind migration, is a phenomenon that interconnects many historical times and lands. The practice of mobility is a fact that permeates all times and has a relevant impact on science, culture, biology, according to Trifu and Terec-Vlad (2015).

In providing a cultural response to one of the most significant socio-biological phenomenon of humanity, boundaries between arts have also been crossed and artists have been transforming compositional materials and methods, creating as an integral process in-between medias, also transcultural and transnational - which we call transmedia.

Since its origin, transmedia has been referred to as a narrative or a project that encompasses multiple media forms, applied in an ambiguous meaning. The various concepts around multiple creative and communicative practices (multi,

inter, cross) imply that it may combine different types of approaches and methodologies, as well as multiple medias and results, like text, music or sound, graphics and animation, moving and still images, performance, and work in multiple platforms and present various types of outcomes, like virtual and physical installations, social media platforms, interactive websites and other forms of new media and emerging technology art.

In saying “transmedia” in this article and research, we are not referring exclusively to the “transmedia storytelling” or common-sense use of this concept. We are defining transmedia in relation to its epistemological meaning of crossing borders, times, meanings and medias, which aligns with the artistic drives of the composition of this project. In this sense, it functions as a way of escape, like poetically said by Andrade (1928): ‘the migrations. The escape from tedious states. Against urban sclerosis. Against Conservatories, and tedious speculation’ (Andrade, 1928: 9).

The Transeuntis Mundi - the subject

The expression *Transeuntis Mundi* derives from Latin, which was the language of the expansion of Western Culture. It personifies the human being who has been taking the adventure to discover and explore the world since the beginning of times. Nowadays, more than ever, it has become more mobile and transhumant, endowed with more tools to create the memories of its journey.

Methodology

The act of walking and walkers are a metaphorical representation of the migrants - *the Transeuntis Mundi*. We are interested in processes around the experience of walking as a method for this practice to have a lively/living/vibrant interaction with the focus of this research: the construction of the culture - the transcultural world.

After reviewing different concepts around walking creative practices, we are concerned with *Walkscapes* as an aesthetic and way to creatively map people and soundscapes of cities/places with transcultural characteristics. It gives a vast spectrum of elements to integrate the multiple dimensions of the transcultural walking experience into a transmedia composition.

The method and concept of *Walkscapes* was created by Francesco Careri (2002), an Italian architect and researcher of artistic and nomadic experiences. For Careri (2002), the act of walking implies a transformation of a place and its meanings. The mere physical presence of humans and the impressions they capture and document from the place while exploring it, already constitute forms of transformation of the landscape and the symbolic meanings of space. He proposes walking as a form of art, an aesthetic method of understanding and interaction with the space, that may combine a multisensorial and multidimensional experience.

Walkscapes aligns with the idea of the millennial phenomena of migration.

Considering this, the starting process of the methodology is designed to use field recordings to create a *momentum* between the place, people and us (the creators), in different cities and countries. Using the strategies of the *Situationist International Movement*¹, we are referencing their practices to let the choice of the moments to be recorded be led by the landscape and be informed by the interest in transcultural evidence.

In order to produce the effect of immersion to the experience, we used 360 and 3D technology to record sound and image, and generated an archive of scenes from different places and moments. This archive feeds our process of transmedia composition: virtual reality works, videos, photographs,

soundscapes, musical compositions and performance, with the aim to immerse the observer/spectator into an experience beyond their space and time of existence.

This project combines a transmedia creative practice mediated by emerging technologies, supported by the processes of artistic research.

Fieldwork Trips

Fieldworks span from 2018 to 2020 so far. Recordings were done in Medellín and Bogotá (Colombia), in Rio de Janeiro and São Paulo (Brazil), in New York (US), London and Plymouth (UK). These places formed the *Derive 01* - as a citation to the *Situationist International Movement*'s strategy. The following trips that occurred to present and exhibit the work draw opportunities for new fieldwork in new places, which now will make up the *Derive 02*.

Virtual Reality

The *Transeuntis Mundi* (TM) Virtual Reality (VR) experience is an interactive application that immerses the visitor into the stories of the archive of this project. In this current version “Derive 01”, 14 stories in 4 different languages and many accents - in 7 cities from 4 countries - have been curated to poetically present our current culture and humanity.

It opens up with an animation that presents the world-map crossed by the first human-walks around the globe for the past over 30,000 years - since the very first human being started our history in Africa until reaching out the Americas. It aims to evoke the experience that we walked, we migrated, we combined stories, cultures and genetic heritage. This process results in the actual visitor using the VR device and deciding on where to go, observe and listen.

The interactivity of the work allows the visitor to create its own journey and timing. In total, currently there are 28 minutes of



Figure A1 - Field recording session in May/2019 in London, UK.

audiovisual work (*Derive 01*) in indeterminate sequence, which would never be experienced in the same way, due to the angles from where the work is approached.

This VR work is presented inside an installation that combines the virtual and the “real” environment. The ambient presents the “Physical Reality” work, with projections and sound sculptures, which dialogues with what is seen inside the VR headsets. The combination of VR and installation generate the aimed total effect of immersion by creating a sum of these experiences on a third level of reality.

Foresight scenes

This is an on-going creative and research project, expanding its content and form of presentations. Its journey can be followed at www.transeuntismundi.com. Currently we are working on composing online works to answer to the 2020 pandemic and world new scenarium.

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Appendix A

Fig. A1 - Field recording session in May/2019 in London, UK.

Fig. A2 - Transeuntis Mundi Logo and overture of the application.

Fig. A3. Image of the Transeuntis Mundi VR Work. City of Bogotá, 2019.



Figure A2 - Transeuntis Mundi Logo and overture of the application.

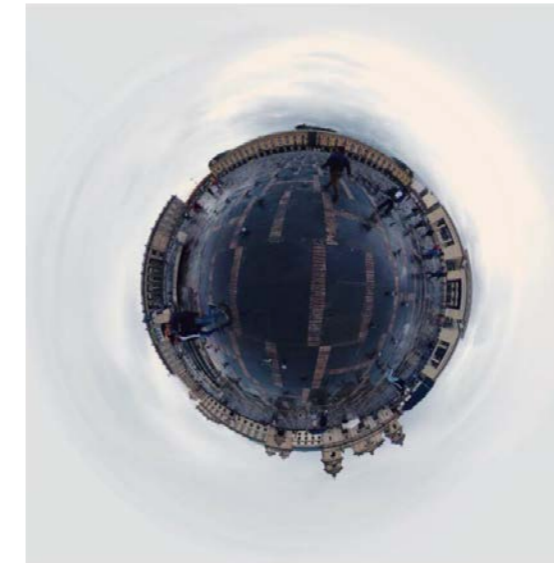


Figure A3. Image of the Transeuntis Mundi VR Work. City of Bogotá, 2019.

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Abstract

This visual essay presents documentation and description of a recent series of water colour paintings created by the author depicting people in the process of interacting with virtual reality technologies. In these works, the public experience of second wave virtual reality technology, is translated into analog artifacts of human machine relations. The author will describe and provide brief lineage of the approach to these works that utilize traditional artists wet media to capture aspects of the VR interface and the humans who use them in this moment in time.

Keywords: virtual reality; painting;
immersion; users.

THE VIRTUAL PAINTINGS: REPRESENTING VIRTUAL CONTEXTS THROUGH TRADITIONAL MEDIA

Virtual Paintings 1996

In 1996, I created the first series of works entitled "Virtual Paintings" - reimagining media portrayals of people utilizing the first wave of virtual reality technologies as large-scale oil paintings. These works were created from appropriated representations of virtual reality as depicted in such publications a Wired, Mondo 2000 and other popular print media. Media representations of virtual reality were of interest to me in that they attempted to create two-dimensional representations of this nascent, immersive technology. Such photographs of first stage virtual reality appeared to me to mirror certain aspects of Soviet era realist paintings - although in this instance images of VR in action served not the power of the state but to highlight the technological present that was at once seductive, heroic and technologically positivistic. (figure 1)

The intention was to create large figurative works using oil paint on canvas as a way to capture some essence of the odd representation of people engaging this new technology - to reify photographic publicity photos of people and VR via oil painting. The series was short lived, however, I found the reference images to be rather limiting in a way, as these were generally PR photographs that had a certain predictable quality.

Virtual Paintings.2 2018-2020

Twenty years later, in 2017, I was invited to show a new gaming project at the "Future of Story Telling Summit" (FOST) taking place in New York City's borough of Staten Island. From the FOST website, the event is described as "... an intimate, invitation-only event that gathers a stimulating mix of thinkers and practitioners from diverse fields who are shaping the art,

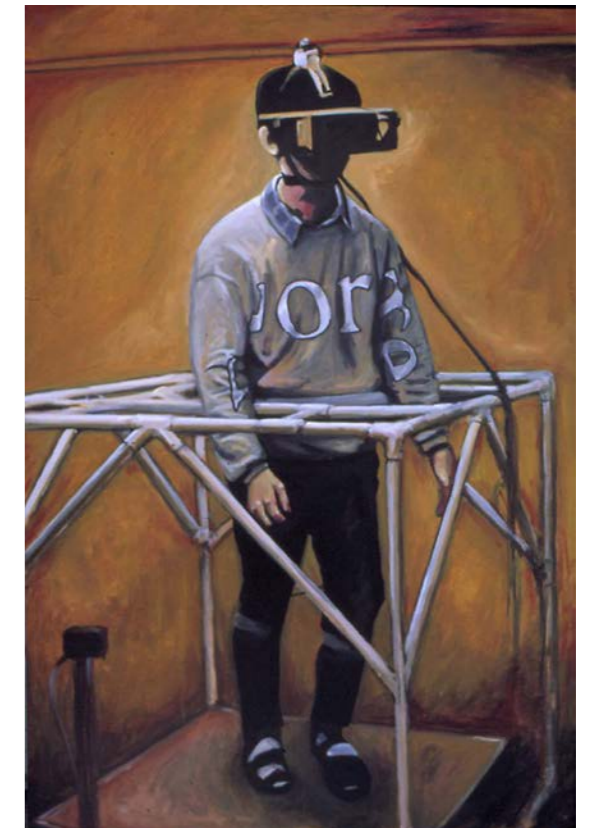


Figure 1. *Virtual Painting 1*, 1996,
48x72", Oil on Canvas

science, and business of storytelling in the 21st century." I had recently developed with the Biome collective in Dundee, Scotland an experimental two-person computer game/simulation about drone warfare entitled "Killbox" that was to be featured at this event.

I travelled to NYC that October to FOST, which promised to provide access to over 100 VR immersive storytelling projects by top producers. At the event, which was held in a converted former Civil War era military base, there were various 19th century buildings and a series of large tents set up to house the myriad interactive set-ups to experience what were some of the latest immersive narrative projects developed from across the spectrum of the VR industry.



Figure 2. FOST NYC two on a bed, 2018, 8x8", watercolour on paper



Figure 3. FOST NYC woman in the trees, 2018, 8x8", watercolour on paper



Figure 4. FOST NYC four at a music festival, 2018, 8x8", watercolour on paper

My direct experience of VR technology prior to this was rather limited – I had tried the odd demo on an early Oculus (the roller coaster and the walking the plank off a tall building, both of which made me feel rather sick).

In visiting the exhibition, I was able to try out a few of the VR works on display. It very quickly became clear though, that the most popular works involved either getting tickets beforehand or waiting in line for significant periods of time. It was as well unseasonably hot and humid that mid-October weekend – as such, the interior spaces where these projects were on display soon became sweltering due to a lack of air conditioning, crowds of visitors and dozens of cpu's running at full bore for the various projects on display. I tried a few VR projects but after a few experiences of sweat drenched headsets I'd had enough. I instead began to photograph people as they engaged VR – collecting a series of photographs that became the foundation for the start of the Virtual Paintings.2. (Figures 2, 3, 4)

The first group of paintings for this new series were all created from photographs taken at the FOST event in 2017. Unlike the earlier VR paintings, all of the photographic reference for this new body of work were taken by me. This ongoing series of works has expanded to include photographic references taken at various VR festivals, workshops, events, university labs and such. (Figures 5, 6, 7, 8) I remain fascinated by our eager embrace and adaptation to current interface technologies – VR remains very awkward, expensive and ungainly to use. These paintings translate a digital moment into an analog artifact of this moment in time. These paintings will likely long outlast these current iterations of VR technology – serving as artistic interpretations of our current embrace of immersive technologies.

I've been colorblind my entire life. I was partially inspired to take on this new series of paintings due to the acquisition of color blind

correcting Enchroma glasses. Prior to shifting to exploring new technologies in contemporary art practice I was initially trained as an illustrator during my undergraduate studies in the early 1980's. Working with color has always been a challenge to me. These new glasses have literally opened up the world to me and have become, in a way, the mechanism towards connecting me to a new reality of color (wearing a different kind of headset if you will).

It is as well important that these images are my own – these come from direct experience, a collecting of images of people and VR. Unlike the previous series that have a rather institutional sensibility – these I intend to be more humanized – a friend suggested these new works are more akin to Edward Hopper's paintings of people alone together, but in these instances, alone, together, with technology. That is a reference I can embrace.

References

FOST Future of Storytelling, <https://futureofstorytelling.org/summit#overview>



Figure 5. Reality Remix Coventry Bruno, Ruth and DJ, 2019, 8x8", watercolour on paper



Figure 6. Siobhan Dance London Ellie, 2019, 8x8", watercolour on paper



Figure 7. ISEA Dubai Guy, 2020, 8x8", watercolour on paper

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Abstract

How are museums around the world designing the exhibition proposals in relation to the contemporary digital context? This poster aims to provide a taxonomy based on case studies of the most innovative exhibition proposals, with the intention of putting in order the very diverse and disparate proposals, so that the museums can develop common strategies that lead to consolidate a model of dissemination and approach a citizen culture in relation to the potential of digital, as well as a sustainable business model between digital and museums.

Keywords: Museum 1; digital 2; Virtual 3; Immersive 4; taxonomy 5.

Introduction

Museums are facing their transition to the digital context very little by little, with very diverse and disparate proposals and without a common strategy of what the museum should be in the 21st century in the digital context.

One of the first tasks that we should do, would be gather the most outstanding proposals of our contemporaneity, and try to make a classification or taxonomy in terms of available technology and proposals in museums.

This will allow us to show what level of development in terms of the immersive proposals in the contemporary museum. This poster proposes a taxonomy, based on case studies, grouping the different lines of action of the most outstanding exhibition proposals in relation to digital technology.

As a first approximation we must distinguish among virtual museums, digital museums, online visits and virtual visits. Within the online visits we must point out that they are semi-creative visits because they are carried out without gadgets and outside the room. Virtual visits, in comparison with the previous ones, are immersive because they are made with gadgets and can be inside the room or outside the room.

In relation to virtual museums we must say that they are those that are born and are conceived within a virtual space, such as the Harddiskmuseum (<http://harddiskmuseum.com/>) of the artist Solimán López. And, on the other hand, there are digital museums that are conceived as absolutely immersive spaces and for the exhibition of works of digital creation, of artists who create, essentially, digital work, such as TeamLab Borderless (<https://borderless.teamlab.art>).

From what has been stated so far, we can affirm that the common objective of all the exhibition proposals studied is "Immersion is experience, experience is storytelling", and this leads us to include two more study variables to evaluate the immersive dimension of these proposals, storytelling and the sensory as an immersive dimension in the keys of creation and culture.

Results

The classification of the different immersive proposals made by different museums are the result of our study. To understand this taxonomy, we must explain that we start from an approach that understands the analogical and digital and, consequently, immersive experiences, not as dimensions that are defined by technology itself, but are concepts that we relate to paradigms of knowledge, paradigms who read, translate and interpret reality differently.

The items that we have analyzed in the case studies included in the poster to assess the degree of immersion of each one of them and, therefore, the experience they offer, are: immersive / semi-immersive, sensory and / or storytelling.

Classification of museum exhibition proposals involving technology and its immersive capacity:

Real-physical museum. Experience at the museum, in the room itself. We have chosen two museums that offer different experiences in the room, augmented reality and mixed reality and each of them involve degrees of immersion and different experiences, as we point out below:

Lázaro Galdiano Museum. Madrid: Augment reality game. Gamification (Seminmersive, no sensory, storytelling). <http://www.flg.es/>

Bust of Akhenaton: HoloForge Interactive: mixed reality pioneer (Immersive, no sensory, no storytelling). <https://vimeo.com/296406685>

Digital museum: museums designed exclusively for digital work. The two museums chosen are the pioneers and the most representative of what is a purely digital museum. Although they share this common desire, they offer different proposals with different implications.

Atelier des Lumières: Immersive experience, no sensory, yes storytelling. <https://www.atelier-lumieres.com/>

TeamLab Borderless: Immersive experience, sensory, no storytelling. <https://borderless.teamlab.art/es/>

Virtual museum: Computer generated image. Classification for both purely virtual museums and virtual visits that allow you to tour the museum in its entirety. Both choices perfectly represent these two ideas. Regarding the Thyssen Bornemisza museum, in relation to the virtual visit, we could have chosen among many museums, but this is one of the best known to us. The Haddiskmuseum is a very peculiar, innovative museum proposal, designed essentially to preserve and spread digital work. The author of this museum, Solimán López, understands that the only possible space for digital work is in itself the digital archive.

Harddiskmuseum: Virtual virtual reality. Immersive experience, sensory/no sensory, no storytelling. <https://harddiskmuseum.com/>

Thyssen Bornemisza: Virtual reality. Immersive experience, sensory/no sensory, no storytelling. <https://www.museothyssen.org/thyssenmultimedia/visitas-virtuales>

Media Museum: We define media museums as those that unite all the previous possibilities and feedback each other, it is like the "total museum". We note that all the previous

experiences mentioned in our classification are combined there. It is a transversal proposal that combines the physical with the virtual, blurring the borders.

The Pushkin State Museum Fine Arts: Reality+digital+virtual+immersive experience+sensory+storytelling. Immersive experience, sensory/no sensory, no storytelling. <https://sketchfab.com/3d-models/apulian-red-figure-amphora-19f7e6edc70a4f6480010493b83a2076>

Discussion and conclusions

The core of the discussion, according to our approach, focuses on the foundation, meaning and genesis of the concepts involved in these practices / experiences studied, at their epistemological basis.

The concepts on which all these practices are based are: analog/digital, virtual or virtual reality (which would already be a different concept), immersive/semi-immersive, sensory and / or storytelling.

Based on this set of concepts, the evaluation of the experiences of the case studies selected in this study, changes significantly according to the conceptualization we make of them.

To begin this study of the concepts that come into play in these experiences, let's start at the beginning, what do we understand by analog? What do we understand by digital? How we understand both concepts will determine the design of technology-art-culture experiences. We start from the idea that analog and digital involve issues beyond the technological fact, they are models of understanding reality, of reading it, of interpreting it, in line with Otl Aicher's approaches. For this reason, we understand that the change from analog to digital implies a paradigm shift.



Figure 1. Poster

To be more aware of this paradigm shift, let's think about the definitions and differences between analog and digital concepts. The analogical as its own name indicates, supposes, in principle, a relation of analogy with reality, in relation to Barthes's theories in his text *La cámara lúcida*. That is to say, we would say that analog media are *analogon* of the world (Barthes 1982, p. 137). That is to say, all analog support implies a relation of similarity and, therefore, a referent; just as all digital technological mediation does not need a reference to be. Now, although, likewise, all analog media –all audiovisual media of an indexical nature– does not entail a referential reality, as any digital medium does not imply a simulated reality. Making a comparison between analog and digital media in their epistemological meaning as well as socioeconomic sense, the philosopher Baudrillard explains it this way:

The relationship between them is no longer of an original with its imitation, neither analogy nor reflection, but equivalence, indifference. In the series, objects become indefinite simulations of each other ... We know that today it is at the level of reproduction - fashion, media, advertising, information and communication networks - at the level of what Marx carelessly called the *faux frais* [unforeseen expenses] of capital ... that is, in the sphere of simulacrum and code, where the uniqueness of the joint process of capitalism is united. (Baudrillard, 2002: 86)

From this perspective and from these case studies, we can already affirm that not all digital proposals are immersive, like analogue, nor that analog and digital entail storytelling in itself, nor a sensory experience

or an experience in itself. same. From this reasoning, we get quite strong evidence that the digital and the analog have to do with the ontological and the epistemological, with paradigms that build models of reality. Thus, the immersive, the sensorial and, consequently, the experience, the experience of creation of art and of culture in the museum context, has other implications, implications that go beyond its connection with technology. We refer to the story that immerses us in the experience, in living an experience: Immersion is experience, experience is storytelling or, as professor Moreno affirms, *The Art Story, the art of the story* (2000), in an article same titled.

Precisely understand that digital and analog have to do with reality models. This idea gives us the opportunity to devise and design exhibition proposals in the digital context that expand the borders of these technologies, offering the public experiences that connect with them, with creation, the arts and the culture that emanates from them and that, therefore it belongs to them.

Having settled the approach of what we understand by analog and digital, we ask ourselves now what do we define as virtual? What is considered virtual? What has to do with the digital or, simply, what has nothing to do with the real? Is it the same to talk about virtual as virtual reality? From philosophy, for example, the concept of virtual is considered an ontological question and from communication we find approaches from semiotics. And how do we resolve this intersection of approaches? The researcher Castañares makes a distinction between the virtual concept and that of virtual reality, because from the ontological approach the "immediate experience of current technologies" (2011) is not considered. And, precisely, the experience offered to the viewer is one of the central problems of the technological proposals of museums, that of experience, what do we understand by experience? Castañares reflects the following:

We consider, like Benjamin, that experience cannot be reduced to mere sensible experience, much less to scientific "experiment". But we also fled from what could be considered a radically opposite attitude: experience cannot be reduced to a network of discursive relations either. The experience implies openness to the other, to that reality (that of the object, that of the other subjects) that presents itself as problematic, even as "dangerous" or "adventurous", since it is continually exposed to the unexpected. (p. 61).

And what else should these museum proposals involving different technologies (helmets, glasses, gloves, etc.) offer us? Taking a virtual walk must involve much more than what technology itself allows, it must involve the experience, the experience of creation and its paths that led there. And, therefore, the immersive, the sensory or the storytelling is also going beyond what technologies make possible. We refer to an experience as a concept that encompasses everything else and that is directly supported by the story, the story as a fact that implies the subject's history, discourse and sensible experience.

We already know what we mean when we talk about the analog and the digital, and when we talk about the virtual and virtual reality, and we have also approached the concept of story as a fact directly involved with experience and this, with everything else, but what can we say about the immersive, what we understand by it and what it implies? So when do we talk about sensory or non-sensory experiences?

In principle, in the selected museum proposals we have indicated as immersive those that are designed for the use of glasses, gadgets because they allow a more immersive experience, and semimersive as those that consume the exhibition proposals in virtual mode but without gadgets. However, in both cases the degree of immersion not only has to do with the possibility of using gadgets but with all that we have been pointing out that implies the experience.

Therefore, the objectives that we have used for each of the selected examples on whether or not they are immersive, whether they are supported by a story or not or whether they are sensory or not, are in a totally permeable space, which intersect and carry, intentionally, to the debate on what is at stake in each of the exhibition proposals related to technology and that we find in contemporary museums.

In the proposed debate there is also the concept of the sensory, of what we understand by a sensory experience. In principle, all those museums and / or collections that we have named as sensory experience are linked with immersive proposals. But really, for an immersive proposal to be sensory involves more questions, it implies, for example, that it involves surround sound and a type of shot that allow the experience to be lived for the viewer in a spatial balance that leads them to forget that they are in a virtual experience. But if we take what we understand by sensory further, we would affirm that we could only speak of a sensory experience in the context of the digital, when the senses are directly involved, as is the specific case of *TeamLab Borderless*, although, curiously, in this museum the Gadgets are not the central element of the proposal that they offer, but what is fundamental is the spectator himself, his physical, sensory experience, with the intention of releasing art from its physical restrictions, appealing directly to the senses of visitors, without that visitor involvement the works would remain unfinished. In such a way that it also has to do with a human-machine connection in which the presence of the machine is not felt. For the creators of these exhibition proposals there are no borders between body and work. From this perspective, this would be, in itself, essentially the only example, of the selected ones, of sensory experience.

To conclude, the final objective is the media museum, the one that does not allow you to distinguish the experience between physical, simulated, virtual space, etc. That is to say,

that in the physical space of the museum they offer you an experience in itself, as well as in the virtual space, since all the possible dimensions of the experience are connected by a single connecting fact, the story: Immersion is experience, experience is storytelling.

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Abstract

This article examines interactive artworks through the lens of 'attraction/engagement strategy' that functions as a compromise between non-interactive and interactive exhibition strategies. The paper investigates the methods employed to attract the attention of an audience and to solicit their interaction with the piece. In connection with various interactive works audiences may encounter a phenomenon that could be termed the 'default functioning artwork', with the piece in its 'default presentation mode', meaning that it is already active as a looping visual representation even before audience interaction has been engaged. The different modes of an interactive artwork, such as its default presentation and active states, are introduced and discussed.

Keywords: default mode, active mode, interactive art, attraction/engagement strategy.

Introduction

A noticeable phenomenon in exhibition spaces displaying interactive artworks is that viewers encounter works that seem to function even without the presence and activity of the user: to be more accurate, they function as a loop and are in a passive state. Such art installations may present visuals or sounds to indicate that something is to be expected and it could be said that they are idling and 'self-interactive', seemingly inviting the audience to act and participate. They function as digital sirens calling out at a distance. When the participant makes his/her determinant move to be engaged with the artwork then the work responds, awakens and springs to life—in other words, it enters its active interaction state. The magic of interactive art now occurs, the previously separated viewer becomes a participant or interactor and the physical body of the artwork wakes up from its sleepy loop and begins its collaboration with the interactor.

In Sommerer/Mignonneau's work *Haze Express* (1999) visual objects, images, accumulations of forms, shapes, and colours move on-screen even in the default presentation mode when the work is not being used by an active participant. When a viewer lays hands on the screen and moves them around, the "non-deterministic evolutionary image composition" (Sommerer & Mignonneau 1999) starts to move according to the direction given by the viewer, resulting in a "semi-realistic and semi-virtual trip through data landscapes" (Sommerer & Mignonneau 1999).

Rafael Lozano-Hemmer's *Zoom Pavilion* (2015) functions without a participant's voluntary interaction. In the terminology of Varvara Guljajeva, this work is post-participative. Viewers enter a room in which they are surrounded by walls covered with multiple projections (Figure 1). Each viewer should hopefully discover their

own image on the wall a few moments later. A similar situation, in which interactive processes are happening prior to the activity of the visitor, is demonstrated in Lozano-Hemmer's work *Zero Noon* (2013) (Lozano-Hemmer 2013) and *Voice Array, Subsculpture 13* (2011) (Lozano-Hemmer 2011). Lozano-Hemmer refers to the invisibility of his work when nobody interacts: "My pieces do not exist unless someone dedicates some time to them" (Ranzenbacher 2001). This subjective sentence sums up what is obvious about interactive artworks: that they become 'real' after somebody starts to use and dedicate time to them. It could even be said that before this time has been dedicated to the work it remains invisible or outside the perception of the senses. Naturally, interactive works need not only be seen and touched, but could be heard or even involve the sense of smell.

Varvara & Mar's artwork *Binoculars to... Binoculars from...* (2013) (Varvara & Mar 2013) is similarly designed to take into account both passive and active viewers. Visitors and pedestrians on the street see the projected image of a collection of chaotically moving eyes. If audience members decide to participate, they must look into a telematically connected device, which streams the image of the captured eye to another location (Figure 2). Both modes, active and passive, are intentionally integrated into the artwork.

There are also works which demonstrate a variety of different states of interaction. Some utilise a recording history, a memory of past interactions. In this kind of art piece, each participant leaves a mark in the artwork. Examples of this are to be found in Varvara & Mar's projects *Three of Hands*, (Varvara & Mar 2015), *Wishing Wall* (Varvara & Mar 2014) and



Figure 1. Rafael Lozano-Hemmer, "Zoom Pavilion", 2016. Photo by: Antimodular Research.



Figure 2. Binoculars to... Binoculars from... (2013) by Varvara & Mar

Wishing Well (Varvara & Mar 2018). The use of recordings of previous participants is also observable in Scott Snibbe's *Deep Walls* (2003) (Snibbe 2002) and Rafael Lozano-Hemmer's *Voice Array* (Lozano-Hemmer 2011). In Lozano-Hemmer's work, each new recording is combined with the cumulative sound-scape of the previous 288 participants' recordings, accompanied by flashes of light. In Tomas Laurenzo's *Memoirs of the Blind* (2018) (Laurenzo 2019) the visitor's face is recorded after he/she blinks their eyes. In this type of work the recordings form the 'default presentation mode' of the installation, and are used to attract the next participant. The recording history becomes the content of the default (idling) mode of the installation and each active participant is related to the subsequent participant as an experimenter, advertiser or introducer of the installation.

Saturation modes of interaction

Regarding the aforementioned states of interaction, it is possible to say that there are interactive installations that have low, middle, and high 'saturation modes' of interaction, defined according to the level of activity of the audience: installations that require different amounts of interaction exhibit different levels of saturation. To exemplify saturation modes of interaction we can firstly identify works with low interaction as being those art pieces or environments where a participant does nothing (as in Rafael Lozano-Hemmer's *Zoom Pavilion*) and all activity occurs autonomously. A minimal activity or reactive mode is involved when the spectator switches on and off the installation (as in Lawrence Malstaf's *Nemo Observatorium*, 2002) (Malstaf 2002). At the other extreme are

works where the artistic concept becomes evident only through the full-body activity of the interactor, in which case the saturation of interactivity is at its maximum and the visitors' location and activity occurs within the work itself—as in Jeffrey Shaw's classic *Legible City* (Shaw 1989) or Kaffe Matthews' *Sonic Bed-*

London (Matthews 2005) in which the visitor must lay down their whole body to experience the soundscape. Many other works from different decades of interactive and telecommunication art could be added here such as: Paul Sermon's *Telematic Dreaming* (1992) (Sermon 1992); Satoshi Morita's *Sound Capsule* (2008), (Morita 2008); and *Ilinx* (2014) by Chris Salter, Valerie Lamontagne and TeZ (Salter, Lamontagne, TeZ 2014). Most interactive artworks therefore, from the point of view of interactivity saturation, could be categorized between two poles: at one extreme the spectator does nothing, and at the other he/she is physically located and bodily connected to the installation.

Extreme examples of 'being within the artwork' are those projects shown in an artistic context but which actually resemble psychological experiments. Steve Maher's *Overhead* (2018) allows participants to observe themselves from above their own bodies. Maher writes: "Overhead is a real-time cartographical perspective device, which allows for an instantaneous shift from ground level "first-person" perspective to that of an over-head "out of body" view" (Maher 2019). This type of work involving out of body experiences erases the distinction between the artwork and the viewer: they become one. Similar experiments with cognitive illusions have been carried out by BeAnotherLab (BeAnotherLab 2012), a multinational research group dedicated to understanding and expanding subjective experiences. This research seems to have a strong political agenda behind it (how to improve empathy and understanding between people), nevertheless experiments in 'swapping' bodies and illusionary embodiment are certainly remarkable, this being a phenomenon which does not occur in reality—perhaps only in dreams. The above examples demonstrate various extensions of participation and interactivity: from simple works where the participant does nothing to projects where the spectator undergoes an imaginary transfer to outside their own body.

There are certainly many clear reasons for building an interactive work that uses the idling, self-interactive mode. Firstly, the artist's intention to fill the room with moving and inviting visuality so as to indicate something is going on before a visitor decides to interact with a work; secondly to manifest the presence and location of the work; third, the desire of the curator or host institution to have a 'screen saver' that reveals the presence and location of the work and shows that the room is not empty (a similar motivation to that of the artist); fourthly, to enrich the installation by adding its recording history, thereby turning it into an evolving piece.

Consequently, we can discuss artworks on a scale of openness. On the one hand are those works that manifest themselves through interaction and hence exist only by the activity of the participant and always present the same sonic/visual experience as a result of what might be termed 'closed programming'. At the other extreme are works that are also born through interaction, but which incorporate the history of past interactions, the user history, and are thus in permanent change—these works 'live', exist and change in time even without active use. We can say that this second group is evolving and generative, is in constant change and could in certain cases be deemed intelligent by means of its use of information gathered from earlier users. In theory, interacting with such works means encountering a new artwork each time.

Interpassivity

To a certain extent, we could describe as a decoying or attraction strategy the situation in which the default and idle mode of the artwork offers the promise of interaction and provides an invitation to collaboration. This terminology can additionally accommodate the passive participant who may undergo an experience without the need to interact: such audience members, preferring to observe the interaction of others, are not uncommon. It could be argued, however, that the non-participative

presence of the passive viewer is a sort of pre-mode and post-mode of every active interactor in the exhibition space upon entering or leaving the artwork—this is completely different from the case where viewers stay willingly aside and do not embrace interaction at all. This may depend on the individual characteristics of the viewer who might be considered shy or introverted, but may

be part of a wider cultural phenomenon identified by Robert Pfaller using the concept of ‘interpassivity’ (Pfaller 2017). Perhaps to this could be added the wider cultural phenomenon of the abundance of interactivity which became omnipresent and therefore potentially uninteresting, with interactive forms of communication becoming the everyday necessities of existence across practically all generations.

Despite the attractiveness of Pfaller’s position in proposing interpassivity back in 1996, his motivation seems to have been to oppose the contemporary excitement about interactivity and he himself now admits that the term “originally fulfilled a primary critical function for media and theory” (Pfaller 2017, 2). To this he adds that “... this original opponent has now largely vanished into thin air” (Pfaller 2017, 2). This particular opinion—that debates about interactivity have vanished—is without doubt contestable, because in the context of interactive art it suggests the artworks to be only shallow experiments. In fact there are many such artworks that deserve attention from aesthetic, historical, technological, psychological or sociological points of view and which provide inspiration for innumerable researchers to re-examine the interactivity paradigm in the wider context of classical art history. In that sense the concept of interpassivity, and the ‘delegation of enjoyment’, is only one concept among many that expand the discussion around attraction strategies in the exhibition space. Pfaller writes that interactivity discourse was more of an ideology than a theory and sadly enough, his concept of interpassivity resembles above all an anti-interactivity agenda that carries strong contra-ideological intentions.

The manipulation of the audience and the ‘myth of interactivity’

Criticism of interactivity was a highly visible thread in the 1990s in the writing of many researchers and artists. Texts written by Alexei Shulgin and Lev Manovich in 1996 are worthy of mention here. Shulgin noted “...that media art means a transition from representation to manipulation” in his Nettime e-mail “Art, Power, and Communication” dated 6 Oct 1996 (Shulgin 1996). Lev Manovich wrote:

“Yes, interactive computer installations indeed represent an advanced form of audience manipulation, where the subject is put within a structure very similar to an experimental setup of a psychological laboratory or a high-tech torture chamber of CIA or KGB, the kind we saw frequently in spy films of the Cold War era.” (Manovich 1996)

Almost diagnosing the situation Manovich states that:

“For the West, interactivity is a perfect vehicle for the ideas of democracy and equality. For the East, it is another form of manipulation, in which the artist uses advanced technology to impose his / her totalitarian will on the people.” (Manovich 1996) Certainly Manovich tries to paint the post-Communism human in a better light, as being very cautious of attempts at manipulation from some external force or person. Interestingly, Manovich almost predicts the future described by Shoshana Zuboff as ‘surveillance capitalism’ which was already approaching in the mid-1990s (Zuboff’s book “The Age of Surveillance Capitalism” was published in 2019). Whereas Western artists were using the Internet as a tool to break hierarchies and bring art to the people, “In contrast, as a post-communist subject, I cannot but see the Internet as a communal apartment of the Stalin era: no privacy, everybody spies on everybody else, always a present line for common areas such as the toilet

or the kitchen” (Manovich 1996). Manovich adds another argument about interactivity being a totalitarian form: “All classical, and even more so modern art was already “interactive,” requiring a viewer to fill in missing information ...”missing” parts of objects in modernist painting...” He states that “... these technologies externalize and objectify the mind” (Manovich 1996).

Interestingly, these opinions existed before the climax of interactive art, which we identify with the beginning of the 2000s (the boom of interactive art started in the mid-1990s). The second, and perhaps final, phase of criticism started in the mid-2000s, and could be linked to Erkki Huhtamo’s article “Trouble at the Interface 2.0” (Huhtamo

2004/2007) and the subsequent debate about ‘non-interactive interactive artworks’ caused by the Prix Ars Electronica category of Interactive Art being awarded in 2004 to a non-interactive (in classical terms) artwork entitled Listening Post (2001) created by Mark Hansen and Ben Rubin (Hansen and Rubin 2004).

Conclusion

Returning firstly to the phenomenon of idle and non-interactive interactive artworks, it may be asked whether the reasons for creating the ‘screen savers’ and self-interactive artworks, as explained earlier, are indeed sufficient. Is the strategy of attraction/engagement and the practice of filling the room and inviting the viewer just a necessary compromise required of artists exhibiting in the white cube or do we see here a new aesthetic canon? In conclusion it seems both hold true: the necessary compromise between the curators and the traditional visiting habits of the public, as well as a new aesthetic canon.

Another question arising is whether the paradigm of attraction/engagement from a distance is typical only of technical and interactive art or can attraction and invitation strategies be

equally observed in classical or other forms of art? Our answer would be affirmative, but this argument would benefit from expansion into future academic research and the possibility is only referred to here in order to bind different research threads concerning the position of the spectator in relation to the artwork.

A third question is whether non-interactive interactive artworks are actually a backlash against the period of manipulation and interactivity in the media arts: is this low phase in the wave of interactive art a normal result of fatigue and the overuse of this form? Again our answer is somewhat affirmative: the trend of reactive artworks and participant interactivity has certainly become mainstream and there is no longer any novelty in it, yet at the same time, the modes of audience interactivity and the systems they use have become considerably more complex and varied. New technologies offer a wide range of possibilities for artists to express themselves and to make the audience experience much richer. We can observe a large variety of different approaches, modes of audience involvement and visual appearances in today’s artworks and these will undoubtedly expand yet further in the future.

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Abstract

This paper examines how eye trackers can be repurposed as art creation tools. Our research project reflects an interdisciplinary collaborative practice that develops novel software and hardware adaptations to provide a tool that can be used with the eye only. Key questions that are raised through our work relate to conceptions of disability, ableism, and how art creation can be disruptive practice to the normative assumptions about what bodies are capable of.

Keywords: Eye tracking, Disability Studies, Ableism, Art Creation, Digital Humanities, Health

Introduction

Our current research project is interested in the concept of ability as it relates to how we consider the embodied nature of individuals: we are in particular interested in how art-making can be a disruptive process, signalling how we understand the relation of the body and its many functions to art making, and how certain kinds of digital technologies can be situated in relation to these considerations. Core to our work is the concept of “Ableism” as it relates to the concept of “Disability”. Ableism is defined as: “A network of beliefs, processes and practices that produces a particular kind of self and body (the corporeal standard) that is projected as the perfect, species-typical and therefore essential and fully human. Disability then is cast as a diminished state of being human.” (Campbell 2001, p. 44). Disability is defined in relation to a normative body, and thus as a set of negative qualities. The ableist perspective “considers a disabled person [as] an intrinsic bearer of a deficit. The dependency-relationship of a person is negatively valued: ‘normal’ means being an autonomous agent, where a centrally valued notion is that the autonomous agent is independent, not dependent upon others” (Carnevale 2015, p. 2). Our project is inherently interested in drawing attention through art making using digital tools to how ableist perspectives define individuals with disabilities.

Discussion

Our approach is to use eye tracking technology, custom software code, and digital screens so individuals can create art with their eyes only, including individuals with limited mobility. This process of art making by using digital tools opens users to notions of ableism, requiring them to consider the very nature of their bodies and how their bodies relate to the art they create. In this paper, we outline some of

the questions and challenges that relate to the creation of accessible art-making tools, and will also demonstrate some of the recent developments in the software and hardware interfaces, as well as discuss future directions.

Our questions, then, relate to digital hardware and software as user interfaces connected to disability, ableist assumptions about the need for the kind of functionality required to create visual art, and the very nature of the creative environment. Through the IMPACT Lab (Interactive Media, Poetics, Aesthetics, Cognition, and Technology) we have developed novel adaptations of low-cost and portable Tobii gaming eye trackers by writing custom software code to allow art creation within a range of modalities such as abstractions created by moving colour dots on a screen, placing and shaping them with eye movements only, by line drawing with eye movements, and by placing and sizing emojis selected from a menu on a screen by using the eyes only. Chris Hayes remarks that technology “has the potential to destabilise the ableist assumptions at the heart of the art world, supporting artists and audiences with disabilities in radical new ways” (Hayes 2018); our interventions with eye tracking technology as art creation mode is intended to serve as such a radical disruptive tool.

Recent developments in our research include what it means to create art by using the body when only eye movements and cognitive processes are involved, what the role of technology in enabling and/or limiting art creation is, how data streams created by eye movements and harnessed by an eye tracker can be translated with software code into images on a digital screen, and how this process of art creation is thus implicated in understandings of digital technology. Our work is meant to

question and disrupt our sense of what art is and how it is created and what the role of physical ability/disability is in relation to how we make art and what we consider to be art.

We set out in our research project to provide accessible tools for individuals to create art by using their eyes only. By accessible we mean ease of use and cost, for both are barriers to access. To address our goals, we use eye tracking technology—a longer-term specialization in our lab—and the expertise we have developed to harness the potential of this technology. Eye trackers have been historically expensive, especially in the research realms where a decade ago research grade machines could easily reach into the \$50-100,000 USD range. In recent years, equipment has lowered in cost, but a reasonably useful machine and software would cost about \$15-20,000 USD. Early eye trackers needed to be fixed in place in a lab environment and required large computers to operate them. In the last few years, the development of low-cost eye trackers intended for gaming use has created potential contexts for eye trackers for accessibility purposes. Tobii, the dominant company in the marketplace, produces the Tobii 4C for Windows-based computers and sells them for \$150 USD. These eye trackers are small and portable, requiring only a laptop to power them. We adapt these eye trackers by writing code in the Unity gaming engine so that individuals can use only their eyes to create things on computer screens, and we have been continuously developing the software to increase accessibility concerns and to refine the user experience. By accessibility we also mean what Lindgren et. al. (2014), consider in their foreword to the catalogue for the “What Can a Body Do?” exhibition. They write, “Access involves more than checking off a list of practical accommodations. It is a way of thinking about the world that challenges us to imagine how another body, another self, experiences it. . . . [in this exhibition] access is treated not as an afterthought but as a creative process intrinsic both to art practice and curatorial

practice” (Lindgren and Sherman 2012, np). Accessibility in our research involves aiming for low-cost solutions as well as ease of use, and it also relates to how art practice invokes an understanding of others and their needs, and access is seen as a key component of research methodology and art creation design. Digital technologies create challenges to access, including high cost, difficulty of use, and lack of support (Borg, Larsson, and Ostergren 2011), (Creed 2018), (Harris 2010), (MacDonald and Clayton 2013), (Phillips and Zhao 1993), (Riemer-Riess and Wacker, 2000). Access should be seen “as a critical and pedagogical tool and a creative process” (Lindgren et al. 2014, np). Supporting accessibility are Universal Design (UD) principles, which we adopt in the construction of our methodologies and as epistemological consideration. UD meshes well with accessibility and ableist concerns, as such principles assert “that the design of the built environment collectively excludes bodies with varying abilities and disabilities” (Hamraie 2012, np). The built environment is exclusionary, privileging some bodies over others to construct what is deemed a disability (Davis 2002), (Wendell 1996). In a universally accessible environment the status of bodies is negated “rather than predetermined by biological lack or excess” (Hamraie 2012, np). The aim of a UD lens is to challenge norms “through designs that include a range of bodies” (Hamraie 2012, np). Disabled artists report that eye tracking presents great potential but that software and hardware limitations have to-date not allowed this potential to fully harnessed (Creed 2018). Our work with eye trackers addresses concerns of ableism, access, and UD usefully. We adapt highly portable low-cost Tobii 4C gaming eye trackers by creating custom software code to de-emphasize barriers that are constructed in relation to disability.

Eye trackers can be categorized as a type of brain-machine-interface, or BMI. BMIs are defined as “an emerging communication technology envisioned to transform the way

we communicate and interact with each other” (Diep and Wolbring 2015, p. 1). A BMI operates “by monitoring specific user brains signals and patterns which are deciphered and translated to control and interfacing external device” (Diep and Wolbring 2015, p. 2). BMI technology can take many forms, but existing forms have tended to require either invasive approaches and/or cumbersome hardware. For example, to capture brain waves and signals, the most effective means have been deemed invasive, requiring surgical implantations (Diep and Wolbring 2015), (Demetriades et al. 2010), (Kim, Park, and Srinivasan 2009), (Milàn and Carmena 2010), (Tonet et al. 2008). These BMIs have cosmetic advantages over non-invasive forms as they avoid having “an external apparatus attached with wires and batteries” (Diep and Wolbring 2015, p. 2). Invasive approaches are not without their challenges, however, which can “include surgical risks, infection, unknown long-term stability and user tolerance post-surgery” (Diep and Wolbring 2015, p. 2). Non-invasive BMIs might include EEG (electroencephalography), fMRI (functional magnetic resonance imaging), PET (positron emission tomography), and NIRS (near-infrared spectroscopy), but all of these methods are reliant on significant equipment and generally are not great candidates for enhanced accessibility. EEG units have advantages over other BMIs because of their lower cost, “safety and convenience” (Diep and Wolbring 2015, p. 2). Yet, they still present clear barriers to access, and though lower in cost than, say using an fMRI machine, they are still expensive and cumbersome to use. In the realm of disability, additional challenges are encountered when considering accessibility. One is the relationship of BMI tools to therapeutic and clinical aims. An ableist perspective has as its goal to correct or “cure” disability, to create various prosthetics to normalize bodies and minds. If, for example, an EEG unit can be used to control a wheelchair, it takes the place of a functional limb. Our approach is to embrace the notion of a BMI as

a tool that opens new possibilities for its users rather than as a tool that wishes to normalize users’ experience: at the present time we are not aware of any other art-making uses of eye trackers, so we have essentially invented a new tool or mode for users. All users are thus in an equal place when they engage with our technology. One way in which art created with eye movements only addresses issues relating to normative bodies is that it bypasses the need for any mobility beyond the need to move one’s eyes. While this does exclude some individuals, any individual, regardless of their mobility is literally in the same situation when they engage with our eye tracker art making tools. As few individuals have experience with the fine control needed to use eye trackers as a tool, for art making or otherwise, this levels the playing field so that all users, able-bodied or not, face similar challenges to one another. In other words, all users are at an equal disadvantage.

Our questions are firmly geared toward what the experience of art-making with the use of eyes only is like, how that experience is uniquely its own (rather than a replacement for a different process), and how the experience of creating art with the eyes can reflexively cause users to further understand the nature of embodiment in art creation, and hopefully gain knowledge about ableism and disability in society). Disability is defined in relation to a normative body, and thus as a set of negative qualities. The ableist perspective “considers a disabled person [as] an intrinsic bearer of a deficit. The dependency-relationship of a person is negatively valued: ‘normal’ means being an autonomous agent, where a centrally valued notion is that the autonomous agent is independent, not dependent upon others” (Carnevale 2015, p. 2). Ableism has had negative effects on individuals with disabilities in social and psychological ways (Campbell 2008), (Kattari 2019), (Keller and Galgay 2010), (Ostrove and Crawford 2006), (Overboe 1999), (Palombi 2012). Ableism arises out of the need to respond to “the compulsory preference

for non-disability" (Campbell 2009) prevalent in society and prioritizes social relationships in the understanding of disability (Davis 1995), (Kafer 2013), (Rogers and Swadener 2001), (Snyder and Mitchell 2006), (Thomas 2004). Ableism "is a social process of discrimination and bias" requiring increased attention to "factors that may impact ableist ideas and actions" (Friedman and Owen 2017, np).

As an integral part of our process we have heeded what disabled artist Kristina Veasey notes as a key to developing technology that is used by those with disabilities. "It's important to involve disabled people in the development of that if you want to be relevant and impactful" (Hayes 2018), she remarks. The development of our work follows from Veasey's caution: we have held several "eyes-on" sessions/workshops with members of local disability groups to more fully understand the specific interests and requirements of individuals who have limited-to-no-mobility. We have found, for example, that eye control of objects on a screen created a sense of a limitless virtual space for individuals with severely limited mobility, reinforcing the notion that art making with eye trackers shifts attention away from the requirements of functional limbs.

Lindgren et al., have defined the art gallery as a "generative space for the growth of disability studies, disability aesthetics, and new models of access" (Lindgren et al. 2014, p.1). They write about the challenges to creating art and art spaces that are not just accessible in the conventional sense—e.g., providing wheelchair access and making them accessible to blind and deaf people—but that also engage the very question of disability within its own set of practices: "This preoccupation with access, though important, has ironically obscured the possibility of disability-related content within exhibitions and other curatorial practices" (Lindgren et al. 2014, p. 9). To address this issue Lindgren et al. created an exhibition that asked: "What does it mean to inscribe a contemporary

work of art with experiences of disability? What shows or forms can inscriptions take? How, precisely, can perceptions of the disabled body be liberated from binary classifications such as "normal" versus "deviant" or "ability" versus "disability" that themselves delimit bodies and constrain action? ... It is important to think about what disability does rather than simply what it is. Such reframing breaks binary constructs as it is focused on a type of concretized being-in-the-world, on the truths of living inside a disabled body" (Lindgren et al. 2014, p. 9).

Results

So, what did we do in the early stages of the project?

We created an eye movement art-making interface using the Tobii 4C eye tracker. We used the Tobii software developer kit (SDK) and prepared code using the Unity Game Engine. Within our interface we created three modes for art creation, and we strove to have each mode be maximally controlled by eye movements only. That is, we wanted there to be no need for any assistance for the user, and we are nearly complete in our goal to have a complete touch-free process.

The first mode we have is line drawing whereby a line on the screen follows wherever it is that the user's eyes move. It is quite challenging but possible to create drawings using this interface. We can change colours by using a colour picker that provides a full spectrum, we can erase a move, freeze a line and pick up in another spot, and draw by using a grid. We can screen capture and print. All done with the eyes.

The second mode is a colour dot scheme whereby the user chooses a dot from a menu and places it on the screen. The longer the dot is focused on, the larger it gets. All other functions are as with the line drawing.

The third mode is a paint-by-number type of tool. We have a pre-set shape and the user chooses a colour and moves to a predetermined spot on the screen. All other functions are the same. We are currently developing multiple paint-by-number modules so users can progress through several levels of complexity and difficulty. The aim is to prepare kits, comprising a tablet and eye tracker, loaded with various paintings that can be used in paint nights or other group art creation activities that typically require mobility to participate.

Conclusions

Where do we want to take this research project?

We want to have paint-by-number kit to distribute in the community for paint nights and other group activities;

We will undertake user experience studies that employ cognitive measures to learn more about how the tools function from a user perspective and what distinctive qualities are needed from a mobility aspect and from a universal design perspective;

We are currently analyzing results from a study comparing the use of an eye tracker vs. an Xbox controller to play a Super Mario Brothers style video game. Preliminary results indicate that users had a positive experience using the eye tracker and showed a slight preference for it, suggesting that this game may be a useful tool to give users practice and training on controlling their eyes for later art creation; We will mount an installation of the eye tracking tools in our lab as a means to engage the community in the process of art making with their eyes only. The purpose of the installation is to get people to consider the embodied nature of art creation, disability, and ableism;

We are waiting anxiously for Tobii to support Linux development so we can add layers of portability to the hardware;



Figure 1. Community-engagement session testing technology.

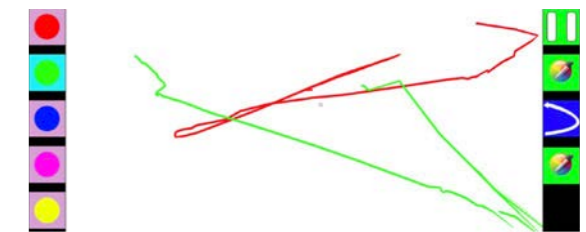


Figure 2. Line drawing screen.



Figure 3. Early prototype of line drawing project.

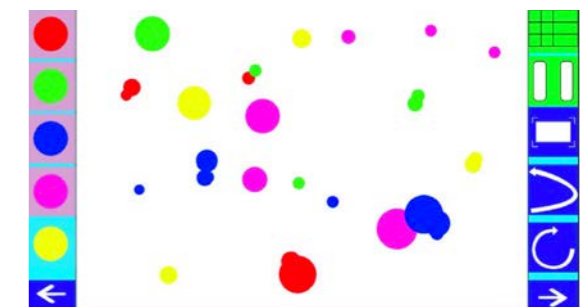


Figure 4. Colour-dot mode.

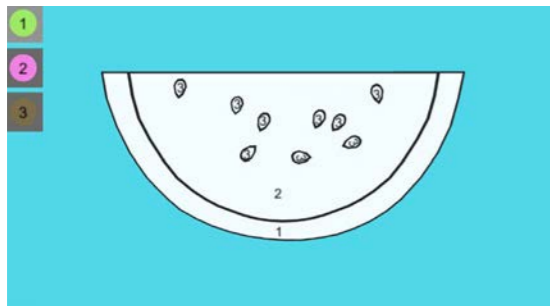


Figure 4. Colour-by-number mode, unfilled.

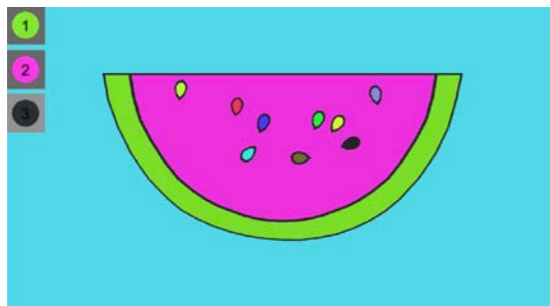


Figure 5. Colour-by-number mode, filled in.

We are working on physical design of hardware to enhance ease of use;

We are working in collaboration with members of the Regina disability community to gain insight into best practices for our technology development.

The development of inexpensive eye trackers has created the opportunity to make art creation accessible for many users, provide the opportunity for all users to experience creativity in a visual art medium. Our research project reflects an interdisciplinary collaborative practice that develops novel software and hardware adaptations to provide a tool that can be used with the eye only. Key questions that are raised through our work relate to conceptions of disability, ableism, and how art creation can be a disruptive practice to the normative assumptions about what bodies are capable of.

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Abstract

New World Synthesis seeks to take up the question of the future and the reviving of emancipatory imaginations in order to sketch the framework for a counter-practice exercised through existing and emergent media technologies. In doing so it will instrumentalize long-standing postulations of the 'third space' of communication— particularly modern spiritualist conceptions of the "ether" and its corollary, the virtual—framing it as the materially and ontologically legitimate stage for the rehearsal of an emancipatory politics. Extending an understanding of communication technologies and media as instruments of occult practice, we will make a case for the cross-temporal exercise of political and economic power through a media practice of incantation specifically aimed at illustrating (and countering) the pre-inscription of futures by present hegemonic orders. To this end we will address the concept of hyperstition and the quasi-mystical predetermination of apocalyptic futures by global capital, so as to point to the potential for hyperstitional counter-practices of incantation exercised through emergent media technologies and their attendant democratizations of narrative power. In closing, the essay discusses how such a political project might take shape around Ranciere's concept of *dissensus* and Ivan Illich's *conviviality* insofar as they represent collectivity in opposition to institutionalization, and as analogous to the occult practice of the séance.

Keywords: synthetic media; art & politics; virtuality; fictioning;

NEW WORLD SYNTHESIS

Introduction

In 2003, with an essay for the *New Left Review*, Fredric Jameson gave us the first iteration of a now oft-repeated sentiment: "someone once said that it is easier to imagine the end of the world than to imagine the end of capitalism"¹—an ever-prescient phrase, born without attribution, peculiarly caught between paralysis and amnesia. It is as difficult now as ever to remember a time when the future felt like an open question; altogether unwritten, an eagerly awaited revelation. Instead, it appears more likely that the eager gaze should meet eye-to-eye with nothing more than vaguely familiar tomorrows, new skins pulled taut over old bones. Even Occupy, that short-lived but shining light, was run out by a patient capital, foot on its neck. In its near-total domination of the present, neoliberal capitalism relishes in an almost mystical command over the future, fashioned in its image through the ritual orchestration of material and energy.

This essay seeks to take up the question of the future and the reviving of emancipatory imaginations in order to sketch the framework for a counter-practice exercised through existing and emergent media technologies. In doing so it will instrumentalize long-standing postulations of the 'third space' of communication— particularly modern spiritualist conceptions of the "ether" and its corollary, the virtual—framing it as the materially and ontologically legitimate stage for the rehearsal of an emancipatory politics. Extending an understanding of communication technologies and media as instruments of occult practice, we will make a case for the cross-temporal exercise of political and economic power through a media practice of incantation specifically aimed at illustrating (and countering) the pre-inscription of futures by present hegemonic orders. To this end we will address the concept of hyperstition and the quasi-mystical

predetermination of apocalyptic futures by global capital, so as to point to the potential for hyperstitional counter-practices of incantation exercised through emergent media technologies and their attendant democratizations of narrative power. In closing, the essay will discuss how such a political project might take shape around Ranciere's concept of *dissensus* and Ivan Illich's *conviviality* insofar as they represent collectivity in opposition to institutionalization, and as analogous to the occult practice of the séance. But first, our project requires a foundation.

Since our earliest reckonings with media, the very act of communication has been imbricated with that of the spiritual. In the *Phaedrus*, Plato writes the account of an exchange between Socrates and Phaedrus, wherein Phaedrus recalls an earlier speech by *Lysias*. Upon learning that *Phaedrus* possesses the written text, an impatient Socrates demands a recitation of the original: "I'll never, as long as *Lysias* himself is present, allow you to practice your own speechmaking on me."² For Socrates, eager to receive the word of *Lysias*, a reading from the papyrus is no more the spoken word of his companion than the invocation of the author's spectral presence. Writing on the *Phaedrus* and erotic figurations of the author/reader dynamic, John Durham Peters hints at a mystical property of the communicative act:

"Since reading was almost always vocal, to write was to exert control over the voice and body of the eventual reader, even across distances in time and space. To read—which meant to read aloud—was to relinquish control of one's body to the [...] writer, to yield to a distant dominating body."³

As a medium, the written speech (presumably penned by *Lysias* himself) assumes a duality of character. As much as the page stands

in for an absent author, the text it carries enacts something of an incantation: the ritual summoning of its distant or dead composer, channeled through the possessed body—early seeds of such mystical thinking are sown. The spoken word, newly bastardized and vulnerable by its committal to page, breaks with its corporeal bind, dispersing through networks of reproduction and exchange to re-present its author anew. And so it is the emergence of writing that portends an early encounter with the “third space” of communication. Suddenly, through the advent of portable media, the human edged closer to channels through which it becomes possible to “communicate across culture, across space and time, with the dead, the distant, and the alien”.⁴ However, physical and static as it is, the early medium of writing is hamstrung by a lack of fidelity, itself unable to represent little more than a schematic of the ethereal life flowing through it. Access would then come only through the development (or perhaps rediscovery) of similarly disembodied, faithfully mimetic media: telegraphy and radio being the earliest. In this regard, Peters’ raising of the idea that “what new media gain in fidelity, they lose by conjuring a new spirit world”⁵ points at once to an affirmation of the virtual⁶, as well as the persistence of an ingrained hierarchy privileging the source over its ethereal double. But the emergence and democratization of telecommunications media in the 19th and 20th centuries would, for a time, see the concept of temporally boundless communication through—and with—the ether enter the mainstream.

After thousands of years, the leap to electronic over-the-air communication prompted frenetic reimaginings of not only the nature of human presence and thought, but of the metaphysical characteristic of our world. Suddenly the earth was awash in previously unseen activity, its surface “supernaturally blanketed by human consciousness afloat in the air”.⁷ In 1964, more than a century after the invention of the telegraph, Marshall McLuhan put forth the understanding of this dimension as not merely

the epiphenomena of communication, but as the outright extension of the central nervous system by electric communication technologies.⁸ For McLuhan, new media (technological as they may be) were in effect “organic and nonmechanical”⁹ by virtue of their practically unmediated coupling with human biology—networked technologies inextricably linked to, and inextricably *linking*, our collective body/mind by way of a shared electrical current.¹⁰ No longer do our media simply mirror the spirit world. And while it could then be said that these currents represent the potential foundation for a transcendental unity of mind, electricity similarly forms the technological basis for recurring claims of cross-temporal contact with both the dead and the not-yet-living. Such formulations of the ether are compelling in that they extend understandings of the ether beyond that of a separate, autonomous realm, in favour of one overlaid with the spectrum of human experience and agency, and thus ripe with radical political potential; suggesting a coalescence and/or reciprocity with material reality, all-the-while unbound by corporeal, spatial and temporal restraints.

As the technologies of telegraphy and radio (and later television, the internet, etc.) brought previously unseen dimensions into view, a handful of social and political movements began to emerge which viewed the ether as a space for engagement, a world parallel to but decidedly unlike our own, an “enclosed and self-sustaining ‘electronic elsewhere’”.¹¹ In the United States particularly, Modern Spiritualists of the mid-to-late 1800’s collapsed the distinction between the technological and clairvoyant medium¹², and women’s movements, seizing on the liberating potential of electronic disembodiment, instrumentalized the spiritual telegraph toward the imagination of “social and political possibilities beyond the immediate restrictions placed on their bodies”.¹³ As much as they carried the promise of communication with the dead, technologies of telepresence brought the emergence of a reinvigorated utopian imagination,

unbound by present limits on the materially possible. Through politicized ritualizations of technology and the communicative act, there was thought to have existed in the ether a symbolically (and by extension, materially) potent means of “articulating the often highly radical aspirations of [...] subordinate political formation[s]”¹⁴ through the occult conjuration of phantasmatic alterities. It is atop of these foundations that we intend to mount re-imaginings of emergent media technologies and the virtual realities they conjure as vectors for political counter-practices of incantation.

The concept of ethereal manifestation through media practice is not entirely without precedent. In writing about the documentary practice of reenactment, Bill Nichols presents the image of an almost mystical conjuration of the past, channeled through the ritual creation of a phantasmatic domain. Describing a scene from Patricio Guzman’s film *Chile, Obstinate Memory* (1997), wherein Guzman cuts together footage of retired presidential guards reenacting their past role, running alongside an empty sedan, with archival footage of the same men guarding Allende’s limousine, Nichols identifies a curious effect. With no president, no crowd, no imminent threat, the recreated tableau bears little resemblance to the original. But still the men perform their previous duty, pacing the empty car, going through a series of motions which, “separated from the substance they once yielded, but coupled to the object as signifier, produce, when successful, their own pleasure” in the phantasmatic.¹⁵ The generation of this “pleasure” is two-fold: the film production of the reenactment itself constituting something of a séance, multiple participants coming together in the mindful invocation of a “temporal vivification in which past and present coexist in the impossible space of a [ph]antasmatic”;¹⁶ and its eventual return, as media, into the ether—folding the temporal plane so that simulation and referent meet. What is conjured is a spectre, a phantasm, the breaching of ethereal presence into the contemporaneous

event. For Nichols, that which plays out in reenactment—facilitated by the lens—is at once the revivification of the past, but all-the-while not entirely of the present;¹⁷ it both conjures and inhabits the ethereal world, primed for reorientation. It is through just such a formulation of phantasmatic conjuration that we might affect the turn to the future that our project demands.

Also writing on the temporal liminality of documentary reenactments, Linda Williams offers an interesting thought on the working of this arcane power: “We thus see the power of the past not simply by dramatizing it, or reenacting it, or talking about it obsessively... but finally by finding its traces, in repetitions and resistances, in the present.”¹⁸ This suggests an archaeology of the trace as point of ingress; of a media practice in and of the ether, capable of opening passageways for the present joining of disparate worlds in resonance. If we’re to take the cross-temporality of the virtual for granted, as emerging technologies increasingly suggest we must, then little stands in the way of performing similar rituals with an eye to the future. Fredric Jameson picks up this archaeology of the trace, applying the logic of presence as resolutely to the future as to the past:

“The presumption is that Utopia, whose business is the future, or not-being, exists only in the present, where it leads the feeble life of desire and fantasy. But this is to reckon without the amphibiousness of being and its temporality: in respect of which Utopia is philosophically analogous to the trace, only from the other end of time. The aporia of the trace is to belong to past and present all at once, and thus to constitute a mixture of being and not-being quite different from the traditional category of Becoming [...]. Utopia, which combines the not-yet-being of the future with a textual essence in the present is no less worthy of the archaeologies we are willing to grant to the trace.”¹⁹

And so it becomes possible to imagine utopian counter-practices taking the representation,

creation and revision of futures as operationally and ontologically similar to the exercise of power in and through phantasmatic conjurations of the past. Edging closer to an activist media practice of occult incantation, we're bolstered by Kittler's sanction: "A medium is a medium is a medium. As the sentence says, there is no difference between occult and technological media. Their truth is fatality, their field the unconscious".²⁰ As the shape of media's ingrained mysticism comes clearer, so too do possibilities for the exercise of its esoteric power; and in delineating existing models by which this power is presently exercised, we may also begin to give shape to exactly what forces our project sets out to counter. In regards to the global hegemony of neoliberal capitalism, this power can most appropriately be described through the concept of *hyperstition*, introduced in the late-90's by the Cybernetic Culture Research Unit (CCRU), a notoriously irreverent cabal of academics working in and around the University of Warwick in the late-90's and early aughts.

By way of a straightforward definition, hyperstition (alternately referring to both a "thing" and a process) concerns the present coming-into-being of fictional narratives in the form of future visions "thrown back" in time to engineer their own histories.²¹ As may already be clear, we see in hyperstition the sociopolitical corollary of Jameson's future archeology: the textual essences of a contingent future "functioning as magical sigils or engineering diagrams"²² for the initiation of their immanent becoming. Having traded heavily in the verbiage of the occult, CCRU's corpus necessarily suggests a framing of hyperstition as akin to the practice of incantation, though one specifically enacted through the quasi-ritualized orchestration of material and narrative power by an ascendant capital. Crucial to our project, the concept also allows for a reading of ongoing socioeconomic volatility as the deleterious effects of hyperstitional "apocalyptic feedback cycles"²³ engendered by the hegemonic powers of Judeo-Christianity

and neoliberal capitalism. As the preeminent vector through which present hegemonies exercise dominion over the future, hyperstitional practice thus becomes essential to the continued existence of increasingly abstract political and economic models based on speculation, virtualization and the calculation of risk.

In his 2016 book *Imagined Futures: Fictional Expectations and Capitalist Dynamics*, Jens Beckert presents a similar view of capitalist predetermination, substituting hyperstition for the perhaps more down-to-earth fictional expectation. Functionally similar to CCRU's formulation, these expectations are crucial to the functioning of capitalism insofar as they allow for present allocations of attention and resources along preordained lines; constructing a fictional image of reality in the present, brought into being by the combined energies of individuals behaving "as if the described reality were true"²⁴ —virtually transforming mundane speculation into a world historical force.²⁵ What emerges is a model of politics wherein futures are willed to develop in line with powerful "science fictions", diverting current into predetermined channels, strategically-dredged into the ethereal plane. This hyperstitional posturing is so foundational to the perpetuation of neoliberal capitalist orders that any major dissonance between the incantation and its conjured future can have wide-reaching destabilizing effects. Referring to the potentially disastrous effects of a miscarried future, William Davies points to the global financial meltdown of 2008:

" [...] mathematical models of a non-empirical future started to be treated with the same level of confidence as the empirical past. Capitalism rests on traffic between the imaginary and the real; it's not just that 'all that is solid melts into air', but that air is constantly materialising into solidity."²⁶

From here it becomes possible to come to adopt an understanding of the ethereal and material

worlds as locked in reciprocal exchange, one shaping the other in its likeness. As initially defined by CCRU (and as our present situation repeatedly illustrates) hyperstitions are, as they are presently practiced, inexorably linked to apocalyptic death drives and therefore fundamentally at odds with the textures of eros and the ether. It is in this discord that our project finds hope, for as much as hyperstition engenders destruction, it describes processes by which the future is open to predetermination and might therefore be co-opted toward emancipatory ends:

" [...] what becomes crucial is the ability of a reconstituted Left to not simply operate inside the hegemonic coordinates of the possible as established by our current socioeconomic setup. To do so requires the ability to direct pre-existing and at present inchoate desires for post-capitalism towards coherent visions of the future. Necessarily, given the experimental nature of such a reconstitution, much of the initial labor must be around the composition of powerful visions able to reorient populist desire away from the libidinal dead end which seeks to identify modernity as such with neoliberalism, and modernizing measures as intrinsically synonymous with neoliberalizing ones [...]"²⁷

The call for politically-motivated instrumentalizations of imagination; of possibility; of magical thinking; of incantation; is heard more and more frequently, albeit reformulated, as we begin the collective task of re-opening an effectively closed future. The late Mark Fisher (formerly of CCRU) articulated this call as a need not for a nostalgic reinvigoration of leftist resistance, but for newly-minted fictions—*effective virtualities* which do not simply oppose the preinscriptions of capital, but actively strain its "current monopolization of possible realities."²⁸ And so the question becomes one of means: what strategies are available in the face of capital's near-total control of society's economic and material capacities? Barring spontaneous revolt on a scale unseen

in recent history, this machinery will no doubt remain out of collective hands. But what remains entirely possible and, as George Monbiot so well articulates, necessary, is the collective re-appropriation of the cultural tools by which we construct and redirect the narratives that define our relationships to the material forces of capital, and to each other.²⁹ In order to meet this challenge we must engage in active practices of future creation, materializing new formations counter to the inscription of state and corporate contingency. Central to this task are processes of remembering and recovering the lost notion of an open future. On the inscription of radically different expectations, Beckert reminds us that "the future is unknown at the moment expectations about it are created. Ontologically, in other words, the openness of the future rules out the possibility of restricting expectations to empirical reality."³⁰ And so we contend that the artificial restriction of our horizon necessitates a turn to the virtual, to conjure new realities from whole cloth, apart from the infertile soil of the present.

Possibility for this commandeering of narrative may lie in existing and emergent media for the conjuration of virtual worlds; particularly technologies of augmented and virtual reality and the (neuro-)algorithmic generation of audiovisuals.³¹ Here, the mysticism of our communications technology takes centre-stage. Artists, cultural producers and dilettantes alike engage in the materialization of limitless virtual beings, objects and environments increasingly indistinguishable from their "real-world" analogues. The halfway suggestion of ethereal presence offered by earlier technologies of television and radio pale in comparison to the outright conjuration of the multi-dimensional virtual being. As much as they cast doubt on the ontology and experience of material realities, virtual media edge technology closer to the fulfillment of its early promise: toward unity of spirit and emancipation from our corporeal bind.³² Of course, it remains to be seen whether they represent the further overlap or integration

of virtual and material planes, or the eventual and total absorption of the material by the virtual itself—and the return to a lost unity so woefully mourned. Either way, therein lies the possibility of transformation, whether it comes through the collective improvement of present existence, or the construction of utopic alterities existing wholly within the “electronic elsewhere”.³³

This requires a reconsideration of our tools and their propensity for social and political destabilization, currently of much concern to the institutions of global hegemony. This is their strength; they demand introspective recalibration, and the recognition of our inherited conventions and beliefs as banners hanging from the beams of a neoliberal architecture—beautiful, but unable to touch the ground. Accessible technologies for the synthesis of image worlds effectively nullify authoritative claims on representation, precipitating shifts in balance of the distribution and creation of arcane knowledge away from traditional centres of power. At the very least, and at the risk of straying into conspiracy, the preoccupation of secret societies with the trappings of the occult is testament to long held beliefs that the key to universal power rests in ethereal practice.³⁴

Organized around models of prolific, collective opposition, and enabled by emergent technologies, we must engage in the exercise of the utopic imagination through media practices of hyperstition geared toward the conjuration of alternative, emancipatory futures. The effective instrumentalization of our decidedly mystical technology calls for the application of a similarly hermetic logics. Projects, political and otherwise, which preclude their metaphysical character are fundamentally handicapped, unable or unwilling to utilize their arcane potential. And so the suggestion is that the emancipatory project must therefore be willing to organize around the principles of ritual practice—adaptations of the spiritualist séance in particular. The sort of collective practices proposed here might benefit from two inherited

formulations: the concept of political dissensus as presented by Jacques Ranciere, and Ivan Illich’s call for an ethos of “conviviality” in the face of full spectrum institutionalization.

In his 1973 book *Tools for Conviviality*, Illich sketches a model of social and industrial progress, framing “institutionalization” as the defining feature of a failing modern society, effectively turning “people into the accessories of bureaucracies or machines.”³⁵ Warning of the pitfalls of specialization, he points to the inherent potential for runaway, exponential concentrations of power in the hands of self-appointed societal shepherds:

“At first, new knowledge is applied to the solution of a clearly stated problem [...] But at a second point, the progress demonstrated in a previous achievement is used as a rationale for the exploitation of society as a whole in the service of a value which is determined and constantly revised by a element of society, by one of its self-certifying professional elites.”³⁶

This process of sequestration parallels present monopolizations of instruments, and the hyperstitional reinforcement of material and ethereal conditions, by the institutions of neoliberal capitalism. In response to this predicament, Illich calls for the resurrection of relations of conviviality, specifically privileging the “autonomous and creative intercourse among persons, and the intercourse of persons with their environment”.³⁷ This is, of course, distinct from present configurations wherein hegemonies precondition the channels for interaction, emphasizing efficiency and (re)production over more discursive modes of engagement. In service of this objective, he asserts that we need tools to liaise with, rather than delegate to, in the pursuit of social, economic and political betterment.³⁸ This necessarily implies the recovery of control through public and political means, redirecting our tools toward the collective reclamation of the “task of envisaging the future”.³⁹

William Davies again:

“To imagine wholly different systems [...] is in itself to resist the dystopian ideal promised by wall street and silicon valley[.] In a time when capitalism and socialism have collapsed into each other, obliterating spaces of alterity or uncalculated discourse in the process, simply to describe unrealised (maybe unrealistic) economic possibilities is to rediscover a glimpse of autonomy in the process.”⁴⁰

The task of collectively railing against the future as promised by power, is to articulate desire through the seance as a dissensual practice. Dissensus, as oppositional to the *consensus* of hegemony, offers a compelling framework around which to conduct hyperstitional practices of future-creation/conjuration in that it entails the basic rejection of hierarchical order, instead describing a politics of collective action among individuals presupposing their own equality in the face systems which deny it. Distinct from practices of protest and resistance, dissensus suggests political actions of mindful assembly around visions of alterity; individuals and groups “working to introduce new subjects and heterogenous objects into the field of perception.”⁴¹ Like the women’s movements of the 19th century, huddled in ritual around the new technology of telegraphy, we gather around the conjured image of realities beyond a restricted horizon—emancipatory visions underwritten by the collective.

The success of this project lies in numbers and the proliferation of alterity, overwhelming the future with visions of utopia. Mark Fisher stresses the point: “It is not a single-total vision that is required but a multiplicity of alternative perspectives, each potentially opening a crack into another world”.⁴² Though our project is one of tending nascent futures into becoming, we are first met with the task of imagining them, thousands of them, for “one cannot imagine any fundamental change in our social existence which has not first thrown off Utopian

visions like so many sparks from a comet”.⁴³ It demands that we unmoor, and bear for chimeric futures—taking heart that we’re not alone:

“What feels from any everyday human perspective like catastrophic change is really anastrophe: not the past coming apart, but the future coming together.”⁴⁴

Footnotes

1 Jameson, Frederic. “Future City.” *New Left Review*, no. 21 May-June (2003).

2 Plato. *Phaedrus*. 228e [emphasis mine]

3 Peters, John Durham. *Speaking into the Air: A History of the Idea of Communication*. Chicago: Univ. of Chicago, 1999: 40.

4 Ibid.: 34.

5 Ibid.: 39. [emphasis mine]

6 For the purposes of this essay, the terms “ether” and “the virtual” are practically interchangeable, with the virtual simply denoting advanced materializations of the ether by digital technologies.

7 Sconce, Jeffrey. *Haunted Media: Electronic Presence from Telegraphy to Television*. Durham: Duke Univ. Press, 2009: 64.

8 McLuhan, Marshall. *Understanding Media: The Extensions of Man*. 1967. Web.

9 Ibid

10 Ibid

11 Sconce, Jeffrey. *Haunted Media...*: 9

12 Ibid.: 24

13 Sconce, Jeffrey. *Haunted Media...*: 26

14 Sconce, Jeffrey. *Haunted Media...*: 27

15 Nichols, Bill. "Documentary Reenactment And The Fantasmatic Subject." *Critical Inquiry*, no. 35 (2008): 76

16 Ibid.: 88

17 Ibid.: 73

18 Williams, Linda. "Mirrors without Memories: Truth, History, and the New Documentary." *Film Quarterly*, 46, no. 3 (1993): 15.

19 Jameson, Fredric. "Introduction: Utopia Now." in *Archaeologies of the Future: The Desire Called Utopia and Other Science Fictions*. New York: Verso, 2005: xv-xvi.

20 Kittler, Friedrich A., et al. *Discourse Networks: 1800-1900*. Stanford: Stanford University Press, 1990: 229.

21 Srnicek, Nick, and Alex Williams. "Accelerationism and Hyperstition." *Cyclops Journal*, no. 2 (August 2017): 14

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25 Carstens, Delphi. "Hyperstition."

26 Davies, William. "Introduction" *Economic Science Fictions*. London: Goldsmiths, 2018: 23.

27 Williams, Alex (2013), "Escape Velocities," *E-Flux*, no. 46: 12

28 Fisher, Mark. "Introduction" *Economic Science...*: xiii.

29 Monbiot, George. *Out of the Wreckage: A New Politics for an Age of Crisis*. London: Verso, 2018: 6.

30 Beckert, Jens. *Imagined Futures...*: 62.

31 A google search for the most notorious of these technologies, colloquially referred to as "deep fakes", offers ample proof of their disruptive potentials.

32 Sconce, Jeffrey. *Haunted Media...*: 26.

33 Ibid.: 9.

34 Of interest here simply for the widely documented overlap in secret society membership and positions of leadership in business and politics.

35 Illich, Ivan. *Tools for Conviviality*. New York: Marion Boyars, 1973: 6.

36 Ibid.: 14.

37 Ibid.: 18.

38 Ibid.: 17.

39 Ibid.: 19.

40 Davies, William. "Introduction", *Economic...*: 22.

41 Rancière, Jacques, and Steve Corcoran. *Dissensus: On Politics and Aesthetics*. London: Bloomsbury Academic, 2016: 2.

42 Fisher, Mark. "Introduction" *Economic Science...*: xiii.

43 Jameson, Fredric. "Introduction: Utopia Now." in *Archaeologies...*: xii.

44 Simon Reynolds qtd. In Carstens, Delphi. "Hyperstition."

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Abstract

Virtual reality is an embodied medium. It extends reality by altering the perception of the bodily senses. However, many virtual reality experiences ignore the body, attempting to leave it behind upon entering the virtual space. As virtual reality is experienced through the body, the conflict between mediated and unmediated senses splits the self between the virtual and actual spaces. We explore the process of embodying a virtual body through the lens of Lacan's mirror stage. Building on psychological research that has established the mirror's capacity to (partially) embody other bodies and artistic installations' capacity to alter and abstract the image of the body, we propose that mirrors can be used to embody abstract virtual bodies that go beyond simulating reality. To accomplish this, we introduce the concept of the mixed reality digital mirror, one which is co-located in both virtual reality and in actual space. The application of mixed reality mirrors is exemplified in the mixed reality installation *Transcending Perception*. From this we propose that mixed reality mirrors may be a promising way to connect the actual body and environment to their virtual counterparts to create a more holistic experience.

Keywords: Virtual Reality; The Mirror Stage; Embodiment

TRANSCENDING THE VIRTUAL MIRROR STAGE: EMBODYING THE VIRTUAL SELF THROUGH THE DIGITAL MIRROR

Introduction

Mirrors have long provided access to virtual space. Well established in everyday life and as artists' tools, the optics of these planar surfaces present an interface to interact with and understand ourselves through the virtual image. They simultaneously externalize and alienate the self from an objective body while situating it within and connecting it to a larger whole. The mirror reminds us of our likeness and difference to other human bodies and that which surrounds us (Lacan, 1949). Most importantly, it makes palpable the embodied mind's presence in reality.

The ongoing proliferation of immersive technologies enable a more intimate, embodied connection with an ever-expanding multiplicity of virtual spaces. These technologies blur the distinction between virtual and actual reality, allowing a physical exploration of cyberspace; however, in entering the virtual space, identity can become disconnected. In many current immersive experiences, the body disappears, represented instead by only hands or controllers. These distal and ethereal means of interacting with the virtual threaten our embodied selves with a translucent existence.

Providing a body in virtual reality (VR) acknowledges our embodied existence that persists when we enter virtual worlds (Hayles, 1991). It allows for a stronger sense of presence in a virtual environment and allows for the body itself to be altered (Slater 2009). It acknowledges the immersant's desire and need for virtual embodiment and creates an opportunity to mediate the body itself. Yet the body may remain estranged and even ignored due to its situation in the periphery of the immersant's restricted vision. In VR, we can make bodies more fluid, ethereal, and abstract than

the immersant is accustomed to, and as such, we need a mechanism to establish a connection between the self and its virtual embodiment.

Transcending Perception (Figure 1) is an immersive installation that uses body tracking combined with a VR headset and projections to allow immersants to use their bodies as musical instruments, producing abstract images and sound (Desnoyers-Stewart, 2018). The projections act as mirrors, presenting a real-time reflection of the virtual space, establishing its physicality and immersants' presence within it. Immersants are connected to co-located abstractions of their body through this mirror metaphor which persists in the virtual imagery of the VR headset.

We used mixed reality mirrors to create the immersant's digital identity by establishing a sense of ownership over the reflected virtual body in a familiar way. It situates their embodied self within the virtual environment presented in the mirror space, authenticated by the familiar connection between the virtual image and reality. Moreover, the two-dimensional nature of the mirror affords its existence both within the reality presented by a VR headset, and as a projected digital mirror outside of the headset. As an object with mixed realities, the virtual mirror projects the virtual space back outwards, allowing it to take on real, physical space.

In this paper, we propose that the mixed reality mirror has the capacity to embody immersants within digital bodies, allowing them to enter virtual space, and enabling the virtual to permeate into physical space. Framed by *Transcending Perception*, and contextualized amongst other immersive digital artworks and technologies, we will



Figure 1. *Transcending Perception* at Nuit Blanche 2018. An immersant is seen interacting with the system as their virtual reflection is displayed in the co-located mirror behind them. The visuals projected onto their body are their virtual representation. Photo Munz Media © Nuit Blanche Regina, 2018.

support this theoretical discussion through the philosophy of Lacan and Foucault while grounding it in psychological research. Mirror space allows for navigation between digital and physical environments, by establishing a connected identity, and embodied virtual self.

The Virtual Mirror Stage

The image seen in the mirror is a familiar one. From a young age, around 2 years old, we learn to recognize our body as our self, distinct from its surroundings—an entity over which we have seemingly exclusive agency. However, it was not always so. This connection between image and identity, and the distinction

between the physical body bound by flesh from an external other, was acquired.

Lacan's mirror stage is the developmental phase in which the self is separated from the other. This formation of a self-other boundary occurs through an exploration of the agency over the physical body coupled with distinguishing between that which is similar and that which is different from the self. Lacan describes the child's discovery of the self in the mirror as: "[An] act [which]... immediately gives rise in a child to a series of gestures in which he playfully experiences the relationship between the movements made in the image and the reflected environment, and between this virtual complex and the reality it duplicates—namely, the child's own body, and the persons and even things around him." ([1949] 2006, p. 75)

The playful exploration of the virtual image in digital installation art and virtual reality parallels this process, and Lacan's concept of the mirror stage may help to understand how we can identify with a virtual avatar through an embodied process. Whether in VR or an interactive installation, as the immersant notices their agency over the image they move and play with it to understand the relationship. This event allows them to identify their existence in the virtual image or environment.

Embodiment through the Mirror

Lacan's mirror stage is foundational in understanding and critically analyzing the role of the mirror and image of oneself in embodying a virtual body. While Lacan uses the child's interaction with the mirror as exemplary of this stage, the mirror stage does not necessarily require a mirror per se. Instead, the mirror stage occurs through the recognition of the image of "self" as distinct from its surroundings. The image of others is also important to establishing the identity of the self.

Thus, the mirror phase involves not only the mechanism of the mirror but seeing other bodies which mirror or contrast with our own.

Nonetheless, the mirror, and the capacity to see one's self "over there" in the virtual image is an important tool which shapes one's identity. In many ways, the mirror, and Lacan's mirror stage, present potential tools and metaphors to better understand how we might embody the virtual self.

Bolter and Gromala state that, "looking into a silvered mirror is an experience of looking at and looking through. A mirror seems to be transparent and to reveal a world parallel to our own..." (2003, p. 34) In contrast however, virtual reality interfaces often seek to be transparent, to disappear completely. Virtual reality psychologist and researcher, Mel Slater, defines presence in VR as "the extent to which people respond realistically within a virtual environment." (2009, p. 3555) Arguably, this focus on "realistic behaviour" originates in his use of VR to conduct psychological studies of "real world" phenomena rather than as an exploration of the possibilities of virtual realities.

To produce "realistic behaviour" requires the medium to disappear and be fully transparent—to be a window, not a mirror. Taken to an extreme, the ultimate form of presence defined in this way would arise in the dissolution of the actual body. In reality, the body's presence always reminds the user of their actual existence and embodied memories along with the virtual reality experience's artificiality.

The Physicality of Virtual Space

Yet, virtual reality is an embodied experience—to remove the body is as futile as it is terrifying. As Katherine Hayles states, "Our bodies are no less actively involved in the construction of virtuality than in the construction of real life." she states that "we can see, hear, feel, and interact with virtual worlds only because

we are embodied." (1996, p.1) As a result, virtual reality needs to reflect our physical and embodied existence rather than ask it to disappear. Mirrors allow the virtual body to exist in virtual space, they create a sense of physicality within the ethereal.

Both virtual reality and the image in the mirror create what Morie calls the "bifurcated self." (2007) Agreeing with Hayles, she claims the physical body cannot be left behind to enter virtual space. The body is simultaneously in two spaces at once, virtual and actual, as shown in Figure 2. Diverging sensory inputs split the body in two. In the mirror we see the self "over there" but our other senses tell us we're still "here." In VR, vision suggests we inhabit another body in another world, but the kinesthetic senses, and the memory of our actual body counter this experience; recalling the body's simultaneous presence in actuality. Understanding that presence is situated in the body and becomes split through the divergence between the mediated and unmediated senses will help to advance our use of virtual reality in new ways. It will allow us to move past the obsession with leaving the body behind and focusing on bringing it with us into cyberspace.

This bifurcation of the self spills out of the experience as the immersant removes their headset. Not only is the body split, but reality is too—the virtual space takes on physicality retained through the memories of the embodied experience. Just as the immersant remembers their actual body and environment in virtual reality, they remember their virtual body and environment when they return to actuality. Foucault states that the mirror is simultaneously both a utopia and heterotopia, a place with no reality and yet one that is completely real (1986). The same applies to the space of virtual reality—it is perceived as occupying physical space and yet is a site with no actual place. Through the digital mirror this heterotopian/utopian space flows out into reality, taking on physical form through the metaphor of the mirror.

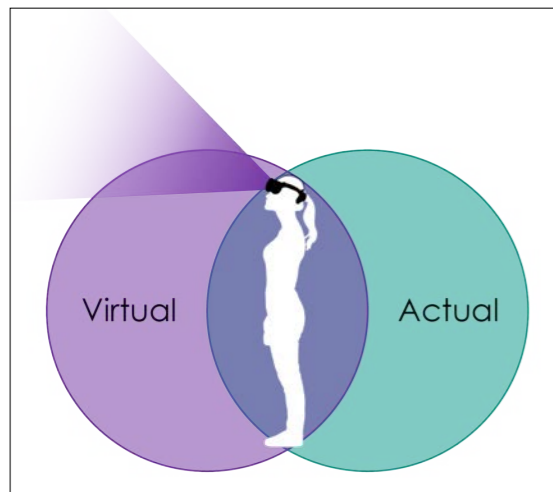


Figure 2. The bifurcated self, split between virtual and actual environments. Revised from Morie (2007) using graphics from © dimensions.com, 2020.

Digital Mirrors

In Psychological Research

Virtual mirrors have been used extensively in psychological studies to create an illusion of body ownership in VR to test the effects of embodying another body on one's behaviour. González-Franco et al. (2010) demonstrated that the synchrony between the mirror image and the body directly affects body ownership. Subsequently, Slater et al. (2010) demonstrated that the use of this co-location and mirror technique was sufficient to induce body ownership without the need for visuotactile synchrony, in contrast to Slater et al.'s previous findings (2009). This realization opened up the possibility of many body illusion experiments. In each of the following examples the participants wore a motion capture suit and could see their virtual avatar from the first person co-located with their body and reflected in a virtual mirror. Kilteni, Bergstrom, and Slater used this technique to show that embodying a casually dressed dark-skinned avatar promoted better performance

in a drumming task over a formal light-skinned avatar (2013). Banakou, Hanumanthu, and Slater showed that embodying a black avatar as shown in Figure 3 (i) could reduce implicit bias (2016). Further Banakou, Groten, and Slater showed that this mechanism could induce behavioural change and alter implicit biases by placing the immersant in the body of a child (2013).

Gonzalez-Franco and Lanier (2017) suggest that these behaviours are the result of stereotypes and preconceived notions of the immersant about the other body that they are occupying. One study by Osmio et al. (2015) shown in Figure 3 (ii), seems to play into the stereotypes of participants explicitly as it begins by having them explain a personal problem to a virtual Sigmund Freud, and then subsequently embody Freud to counsel themselves about that problem. The researchers demonstrated that embodying Freud had a significant effect on the improvement in mood and happiness. Once again, a mirror is used to reinforce the sense of embodiment, but in this case to also reinforce embodiment within another body while one's own body is in plain view.

Notably, amongst the authors in all these examples is influential VR psychologist, Mel Slater. According to Slater et al., "One of the advantages of a virtual reality representation is that it is possible to easily go beyond what is feasible in the physical world." (2009, p. 217) Yet many of these psychological studies center around reproducing "realistic" behaviour through "realistic" representations. The uncanny representation of the simulated "realistic" human seen in these examples points to its artificiality without acknowledging it. Nonetheless, these psychological studies demonstrate the plasticity of body ownership which allows humans the capacity to enter another bodily representation. Gonzalez-Franco and Lanier point to several studies which suggest that this plasticity could allow body ownership to be bent beyond conventional human forms (2017).

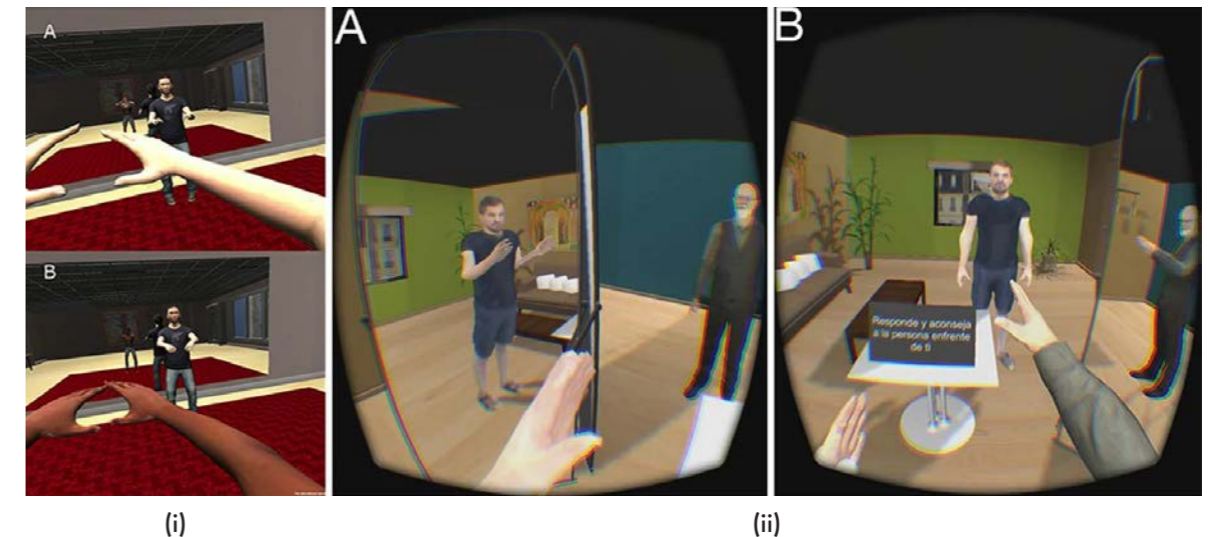


Figure 3. Examples of mirrors used to induce body ownership in Mel Slater's experiments. (i) Two conditions from Banakou et al. (2016) where the participant does Tai Chi while in a White or Black body. © Banakou, Hanumanthu and Slater, 2016, CC-BY. (ii) In Osmio et al. (2015) participants first embody a virtual version of themselves (left) while explaining a personal problem and then embody a virtual Freud to counsel themselves on how to resolve the problem © Osmio et al., 2015, CC-BY.

In Installation Art

Through the focus on reproducing reality, these examples fail to imagine the potential of virtual reality to expand reality. If "realistic" representations lead to "realistic" behaviour, then could abstract and ethereal representations alter that behaviour? Could this proven mirror metaphor continue to hold when the body loses connection to its familiar form?

There are many examples of abstract digital mirrors in interactive art. Perhaps the most famous are the mechanical mirrors of Daniel Rozin. His mirror installations manipulate tiles of materials to form a reflection in an array of physical pixels, reminding the viewer of the physicality of the digital interface and how it mediates their identity.

Golan Levin uses a mirror metaphor in his large-scale interactive projection, Ghost Pole Propagator, shown in Figure 4. Here, bodies are abstracted using an algorithm commonly used in Optical Character Recognition (OCR) to simplify

them to petroglyph-like stick figures. This mirror reflects a glyph which focuses the participant on their posture and gesture, allowing them to form new symbols with their bodies.

Chris Milk uses the abstract form of the shadow and a mirror metaphor to transform the participant's body in his Kinect-based interactive installation, The Treachery of Sanctuary. In this triptych, the user goes on a journey through phases of birth, death, and transformation, represented by birds being emitted from the body, birds attacking the body, and finally ending with the participant's shadow spreading wings and flying away.

Transcending the Virtual Mirror Stage

What is unclear in these artistic examples is whether the mirror image on its own is sufficient to create the illusion of body ownership over the reflected image. The participant sees another image in the mirror but when they look down they still have their own body. In this case, perhaps the mirror actually reinforces



Figure 4. People interacting with Golan Levin's Ghost Pole Propagator II. Their bodies control the appearance of the glyph-like figures seen in the large laser projection © Golan Levin, 2016 CC-BY.

a boundary, creating a more externalized sense of control over the marionette behind the mirror. How can we transcend this virtual mirror stage and embody these abstract bodies?

Transcending Perception

In the virtual reality installation, *Transcending Perception*¹, (Figure 5) co-located digital mirrors are used to project the virtual space outwards with the aim of combining the actual and virtual and combating the bifurcation of the self and space. In its third public exhibition at the 2019 Richmond World Festival, Digital Carnival we transformed the inside of a shipping container into a stage surrounded on three sides by virtual mirrors. It was used by an estimated 1000 participants over two days and served as the site for several experimental VR dance performances, where participants could watch dancers through the VR headset or the virtual mirrors (Figure 6).

In *Transcending Perception*, bodies are tracked by a Kinect in 3D space and transformed into ethereal particle system bodies. These



Figure 5. Several people interacting with *Transcending Perception* at Nuit Blanche Regina 2018. The projections behind them act as mirrors of what can be seen in the VR headset. Photo © Yujie Gao, 2018.

bodies translate movement into instruments of light and sound. Up to 6 participants can simultaneously interact with the projections. One participant can put on the VR headset and enter the virtual space completely as the people who surround them are abstracted into the forms seen in the projections in 3D space.

The Mixed Reality Digital Mirror

Missing from previous examples was the co-location of the virtual and physical mirrors. In the examples of VR psychology research, the mirror exists only within the virtual environment. Meanwhile, in the examples of artworks using digital mirrors, the space within those mirrors is as impenetrable as the physical mirrors that they are inspired by.

In *Transcending Perception*, the mirror metaphor was used to create a sense of three-dimensional space that would form an initial stage of immersion and allow for interaction without the VR headset. To accomplish this a "mirror cave" was used, consisting of virtual mirrors projected onto three walls that surrounded the user while leaving an open entrance for progression between observation and interaction. In the image shown in Figure 7 you can see the immersant looking at the very same reflection that we see in the projection—we see what she sees through the mirror.

These mixed reality digital mirrors are created by co-locating projections of the reflected virtual space with mirrors in the virtual environment. The body tracking alters the projection to align with the user's head, matching the perspective of a real mirror—an effect so natural that it becomes transparent to the tracked immersant while simultaneously being made evident to others as the perspectives of onlookers are warped to conform to the tracked immersant's point of view.



Figure 6. An audience member watches a performance by Annabelle Wong through a VR headset, those waiting for their turn to watch in the headset see the same imagery in the projections. Photos © Ash Tamasiychuk, 2019.



Figure 7. An immersant playing with their abstract reflection in the mirror demonstrating the parallel between the mirrors seen in the headset and projections. Photo © John Desnoyers-Stewart, 2018 .



Figure 8. Participants interacting with *Transcending Perception* in a variety of different ways. At the top an immersant interacts while looking in the co-located mirror; in the centre, an immersant looks at the virtual representation of another's body; and at the bottom an immersant actively plays with the visuals presented in the VR headset. Photos © Ash Tamasiychuk, 2019.

Extending Reality through the Mirror

The physically co-present, mixed reality digital mirrors help to unite the actual and virtual body, to counter the bifurcation of the self and transform virtuality into an extension of actuality. The immersant is still aware of their actual body, but their senses no longer disagree with their virtual body. This allows immersants to embody very abstract and ethereal forms.

Figure 8 shows several examples of immersants interacting with *Transcending Perception*. In the first image you can see an immersant beginning to interact with the system, looking in the virtual mirror to see their virtual body for the first time. In the second image the immersant looks at the virtual representation of another. Their familiar appearance is transformed into a magical display of light and sound that responds to their excited movement. In the third image, an older adult is seen playing with the lights and sounds, inspired by the body's extended potential to move expressively in front of a crowd of onlookers. These images also demonstrate a common progression seen as immersants go through this virtual mirror stage, from first noticing the reflection, to timid exploration, to expressive movement and playful interaction.

The immersant retains their virtual body both in the VR headset and outside of it—taking their actual body in with them and bringing a virtual one back out. Their virtual body is not somewhere else, but here—continually co-present as long as they remain in the active space. More than this, the VR experience becomes a virtual mirror world, with the actuality of human bodies injected into the virtual experience and their virtual representation projected back out into reality through the VR headset and mirror projections. In *Transcending Perception*, the virtual mirror projects the virtual space back outwards, allowing it to take on real, physical space. The virtual space becomes a simulacrum of reality, and reality a copy of the virtual—each a copy

of one another without original. The actual and virtual are blurred together into a hyperreality. This hyperreal space takes on the utopian and heterotopian qualities of the mirror itself, simultaneously actualized and virtualized.

Implications/Applications

So far, this work has shown that the embodiment of radically abstract bodies is possible through the use of a mixed reality mirror, and that mixing reality through the mirror expands reality and connects the virtual and actual selves, allowing a more complete and united embodiment than would otherwise be possible.

Lacan suggests that this division between self and other is a misrecognition, a false dichotomy that is far less strongly defined by the boundary of our bodies than would appear. Is it possible for mirrors to enable a dissipation of the very self/other boundary formed through the mirror stage? We are extending the tools used in *Transcending Perception* to explore this question in our ongoing research (Desnoyers-Stewart et al. 2020)—sharing and mixing between bodies and seeing how far beyond the body embodiment can take us.

Conclusion

Lacan's mirror stage provides a theoretical foundation for understanding the process of self-identification and the role of the mirror mechanism in establishing that identity. The virtual mirror stage is the process of discovering our agency over a virtual body and identifying the self with that body. This playful exploration forms an essential step in embodiment within virtual bodies.

By mirroring reality into the virtual experience and vice-versa, *Transcending Perception* allows immersants to identify with their virtual body while establishing the physicality of the virtual space. Using co-located digital mirrors, *Transcending Perception* connects the

virtual to the actual, mixing those realities to expand reality. As we enter the virtual space of the installation, it spills out into physical space. These tools and metaphors can allow us to transcend the virtual mirror stage, embodying our virtual selves through the identity established in the digital mirror.

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Footnote

1 A video of *Transcending Perception* at the Richmond World Festival 2019 <https://youtu.be/XLH6DyXihRI>

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Abstract

Remediating the ruins of a cold war site via 360 filming raises many questions about memory, technology and the military heritage of Virtual Reality. This paper explores the collision of UFO and folk sub-cultures within the cold war ruins of a semi-abandoned air base in rural Suffolk; it was first presented as a form of performance at DRHA 2019. The author discusses the deployment of VR as an environment for writing about and re-evaluating the past and its post war power relations, citing Rose, Suchman, Fisher, Dillon, Augé and Virilio. The result is a remediated script for a performance which provides a counter to the predominantly neoliberal rhetoric of immersive media, VR empathy and technological-determinism, presenting instead, something messy and fragmented, uneasily reconcilable with a corporate vision of Virtual Reality. The work is framed as a pedagogic provocation, deployed within teaching and academia as a form of Brechtian alienation, to deliberately disrupt and confront the *immersive turn*.

Keywords: VR; Memory; Cold-war; East Anglia; Immersive media; Criticality; Pedagogy;

RENDLESHAM 360

Introduction

I'm sitting in the car park, my back on fire–In flames..... striking matches–The hum of pop tunes, Northern songs–Listening to the news: Civil Service strikes, air strikes, Ripper strikes, Maggie, Maggie, Maggie–Out, out, out (Peace, 2001:147).

In the headset, it's dark for a few moments, then, in an instant, I'm there - beside the East Gate of the now semi-abandoned American and British administered air base at RAF Woodbridge, Suffolk. I'm standing in Rendlesham Forest, the ground hard and un-forestlike beneath my feet. On my left the ruined base is protected by a gate, behind the gate there is a run-down, empty guard house, straight out of *Colditz* or the *Great Escape*. The perimeter fence cannot fail to evoke a concentration camp or a prison, or the *cold* war, with its aging barbed wire, its desolate eeriness. But the site is not a place of incarceration, it is currently used for helicopter training. Every now and then a British Army Air Corps helicopter thuds lightly overhead, venturing out for exercises, engaged in war rehearsals, prepping for a show which, it seems, will always go on.

In the distance, a 9000-foot band of yellow flowers have colonised the vast air strip. The view of the runway is cinematic, a longshot - the only view of it available here, as Augé says, one which makes us 'forget the effects' of 'discontinuity and interdict', a mirage that 'disintegrates if we look at it too closely' (Augé, 2008:XIII). What I am looking at is a redacted landscape, an aporia in the information panopticon.

The following paper/performance is an attempt to remediate this scene, to represent that which has been redacted from history via the paradoxical means of immersive media. The research by practice asks what are the limits

of this representational technology and how its military association relates to a subculture of UFO sightings and East Anglian folklore? The work sits within a 'Praxis curriculum model', the nexus between theory and practice, in which 'the praxis model perceives knowledge as provisional and accessible to criticism, the model confronts traditional notions of knowledge, and the opinion of authority and coercion. the praxis model is valuable because it has explicit application to students' everyday lives' (Aubrey, 2017:140).

Results

To speak of results in the context of this arts practice is to instrumentalise that which is intended to remain contingent, revisable and negotiated. The meanings which have emerged from this project are varied, from irritation and hostility (for those heavily invested in the cycle of grant funder imperatives or the neoliberal rhetoric of technological determinism) to positive relief that an alternative framing of VR technology is possible, as well as a critique of the often credulous use of VR within neoliberal funding mechanisms which do not promote critical enquiry; such an enquiry - into the ambitions and ideologies of Big Tech corporations and their association with the military is urgent and overdue. Suchman, Rose and the other writers cited here are presented as rare purveyors of sober criticality, among the metricised milieu of neoliberal academics, gamified to seek funding whatever the moral, intellectual or epistemic costs. My work may therefore be framed as a pedagogic provocation, deployed within teaching and academia as a form of Brechtian alienation, to deliberately disrupt and challenge the immersive turn. Rendlesham 360 has been 'performed' three times and discussed at symposia and in masters level workshops, and is currently

part of an action research led project about pedagogy and philosophy within the context of art and design education, supporting a pedagogy which, as Coles suggests (2014), should provoke students 'to demand equality for themselves and others,' despite an apparently inescapable backdrop of Capitalist Realism.

Discussion

From the 1940s onwards, East Anglia, where Rendlesham Forest is situated, was the location for a wide range of Cold War sites, including American air bases and the UK's Nuclear Arsenal. If military conflict had erupted during the cold war years, if the Cold war had become a Hot war, East Anglia would arguably have been annihilated. Despite the potentially devastating impact of the 'air bases, nuclear weapons sites, secret laboratories, listening stations and firing ranges, the scale, significance, and most importantly, the impact of the gradual and rather secretive militarisation of the region in the period remains largely uncharted' (Wilson, 2014:6). How then, do we relate VR, presence and the idealising technologies of immersivity with a military industrial 'heritage' which was largely redacted? David Peace's *Red Riding Quartet* quoted at the start of this paper, rips into the political and social power relations of the UK in the context of the 70s and 80s, within what Mark Fisher called 'a Gnostic terrain. The Gnostics believed that the world was made of a corrupt matter characterized by heavy weight and impenetrable opacity' (Fisher, 2014). VR is arguably incompatible with the murk of a Gnostic terrain, its proponents frequently claim an unparalleled realism for it, enabled by unprecedented degrees of mediated freedom, propped-up by ideologies of presence, empathy and participatory agency. But VR is also technology and an ideology of huge importance to the military, entangled with the military-entertainment complex Suchman writes of, in which:

critical consideration of the trope of "sensorial

presence" in immersive simulation reminds us that the senses "cannot be divorced from the political, economic, historical, technological and linguistic realities that govern the sense we make of them" the relationship between military simulation and commercial entertainment has a long history. (Suchman, 2015).

Suchman identifies situational awareness and 'the requirements of "positive identification" and "imminent threat" that underwrite the canons of legal killing' (ibid). She connects them to 'related questions of intelligibility and identification, and more particularly through a frame inspired by Judith Butler's analysis of recognition's generative agencies, "those unthinkable and unlivable bodies

"that do not matter in the same way"... Which take on further resonance in the context of simulation, as another sense of bodies differently materialized.readings of "us" and "them" that are so central to war' namely

'Us who are real, versus them who are virtual

Us who are Americans, versus them who are Other (generally Arab, more specifically Iraqi and Afghan)

Us who are friends, versus them who are enemies' (ibid).

Satellite imagery makes the airbase at the heart of Rendlesham Forest look like the drawings at Nazca, a series of geoglyphs engraved into the flat Suffolk landscape. Zoom-out on Google Earth a little further, and you realise the air base is at one of the Eastern-most points in Great Britain, not far from Orford Ness's ruined 'bomb ballistic' testing ranges, former site of the Atomic Weapons Research Establishment and Cobra Mist, secret name for the long-range surveillance radar system which once stood here, 1717 miles from Moscow, but more crucially, a front row seat for the Theatre of War. The idea, fuelled by Ronald Reagan's comments in October 1981, that the continent of Europe could

become the theatre of a limited nuclear war.

Inside the headset, against the base's perimeter fence, ferns sway as if they possess intention, as if reaching out to me in the mode of horror film antagonists, 'Don't enter', 'Stay away,' the ferns seem to be pleading. But the horror spatial narrative is over-rehearsed, almost non-cognitive, straight out of the Hammer Horror films imaginary, primed by the kitsch signposts for the Rendlesham Forest UFO Trail, the clichéd alien head, the promiscuous use of Greek letters to evoke a pseudo-scientific decoding of the site, a pastiche cold-war exegesis in a clunkily gamified terrain.

The airbase is now a rehearsal space for future wars, a genocidal scenography arguably occluded by the flying saucer theme. But, of course, we know the truth is microtonal, subject to a fractality Jean Baudrillard speaks of in *Screened Out*, in which he writes of the truth as 'just as a fractal object' which 'no longer has one, two or three dimensions (in whole numbers) but 1.2 or 2.3 dimensions, so an event is no longer necessarily true or false, but hovers between 1.2 or 2.3 octaves of truth' (Baudrillard, 2002:93).

The microtonal or fractal truths of December 1980 as mediated by the British press, are as follows: 'something remarkable was said to have occurred outside the US Air Force base at Woodbridge.....News of the event leaked out slowly, finally hitting the headlines in October 1983: "UFO lands in Suffolk - and that's official", screamed the front page of the *News of the World*"'(Ridpath, 1985). The story was sensational, describing how 'a group of American airmen who were confronted one night with an alien spaceship in Rendlesham Forest, which surrounds the air force base. According to the story, the craft came down over the trees and landed in a blinding explosion of light' (ibid). The group of airmen attempted to get a better view of the object, 'but it moved away from them as though under intelligent control.

The following day, landing marks were found on the ground, burns were seen on nearby trees, and radiation traces were recorded. There was even talk of aliens aboard the craft, and allegations of a massive cover-up. It had all the ingredients of a classic UFO encounter' (ibid).

Of the event, Prime minister Margaret Thatcher was reputedly said to have remarked: 'You can't tell the people' (Clarke, 2014), the witnesses, US Airmen Burroughs and Penniston 'have both had hypnosis since, but UFO sceptics claim they could just be remembering science fiction movies that they had seen' (BBC News, 2010). This describes my own relationship to the site, filtered through film and language, through the myriad alterities and imaginaries of the last 55 years. It certainly chimes with Baudrillard's assertion that in some conditions 'it is the Virtual which thinks us, not the other way around'(Baudrillard, 2002:120). And now, with Virtual Reality technology and 'the extraordinary hype surrounding it. The excess of information, the massive advertising effort, the technological pressure, the media, the infatuation or panic-everything is contributing to a kind of collective hallucination of the virtual and its effect' (Baudrillard, 2002:120). Lucy Suchman is more circumspect:

Rather than a progressive assault on the real, the turn to virtualization technologies rematerializes imaginaries of lived reality, with real, material consequences. I take seriously the imaginaries informing virtual reality projects, while maintaining a critical skepticism regarding the extent to which the technologies actually realize their imagined promises (Suchman, 2015).

Suchman writes of 'the premise of rehearsal as a means of war's rationalization and management', but rehearsal is also always:

a virtual exercise, informed by remembered pasts and realizing events in an imagined future. On the other hand, rehearsal is not simply preparatory but also performative, and training articulates the real in ways that have consequences. Configurations of real bodies and virtual realities open up sites of slippage

and resistance, and it is in the irremediable gaps between rehearsals for war and the lived realities of embodied conflict that counter-stories emerge (ibid).

The military turn to virtuality is evidenced by its eye watering expenditure, by the 1990s, 'academically based computing research found new funding sources to develop high-end simulations for military training, and over the past twenty years researchers have increasingly turned to the game and film industries for advice on scripting and production effects. In 1992, STRICOM, the Army's Simulation Training and Instrumentation Command, was established under the banner "All but War is Simulation"' (ibid).

Back to the forest in the headset, and a few meters away a pale group of children and adults examine the latest alien sign in the UFO Trail. Through tinny speakers, their voices are distorted by crackle and low fidelity, their bodies elongated by corrupted visual ratios that make them resemble the Green Children of Woolpit, who spoke a mysterious language and lived on broad beans, with their green skin and tales of emanating from an East Anglian underworld called 'St Martin's Land'. East Anglia has myriad ghost and supernatural tales, my East Anglian grandmother believed in fairies and would have known about the Green Children of Woolpit, the luring Sprights of Elvedon, Black Shuck the ghost dog, the dead soldiers washed up on Shingle Street. In those tales the division between worlds and times is as fragile as David Peace's conflation of Heaven and Hell, the past and the present, the living and the dead all exist in a realm of haunting spectral forces. Do the children at the perimeter fence know about these stories, what must it seem like to them – to those who are free from crushing retrospection, who never knew the 1980s? Do they believe in a future in which time does not fold into or repeat itself, which does not succumb to Fisher's 'crushing sense of finitude and exhaustion' (Fisher, 2014)? Perhaps they agree with Augé, who believes that one day there might be a:

sign of intelligent life on another world. Then, through an effect of solidarity whose mechanisms the ethnologist has studied on a small scale, the whole terrestrial space will become a single place. Being from earth will signify something. In the meantime, though, it is far from certain that threats to the environment are sufficient to produce the same effect (Augé, 2008:98).

Not far from Rendlesham Forest is the seventh century ship burial complex at Sutton Hoo, a 1400-year-old militarised site, with technologies of visual domination grafted into the landscape. In the wider scale of things, it seems little different from the air bases, from the other ruins of domination. Further up the Suffolk coast, the 'Ghost village' of Dunwich, once capital of the Kingdom of the Eastern Angles, is now a drowned city, but, according to folk legend, the bells of Dunwich's many churches still ring out from beneath the waves. All of these and wider, military-industrial sites have captured my attention in revisiting the Cold War, indeed, an earlier attempt to photograph a Cold War site (the Ballistic Missile Early Warning System at RAF Fylingdales in Yorkshire) was subject to an inexplicable purple glitch; A pattern of interference in which the 'space between the true and the false is no longer a relational space, but a space of random distribution' (Baudrillard, 2002:93). in which the uncertainty principal 'does not belong to physics alone; 'is at the heart of all our actions, at the heart of 'reality'' (Ibid) and, it would seem, all our attempts to represent it. Fisher wrote of 'a detached spectatorialism' which 'replaces engagement and involvement. This is the condition of Nietzsche's Last Man, who has seen everything, but is decadently enfeebled precisely by this excess of (self) awareness' (Fisher, 2009:6), a condition brings to mind the Swayze Effect of VR, 'the sensation of having no tangible relationship with your surroundings despite feeling embodied in the virtual world' (vrglossary.org), a reference to the film *Ghost* (1990), in which Patrick Swayze played a dead man helplessly watching his wife The Swayze Effect is the sensation that

we can look but cannot intervene. It is the sensation which regularly engulfs me as we race towards populist atrocity, a racist free for all, in which the 1970s and 80s become more prescient, and with them the sense of a return to the politics of sectarianism, American militarism, police powers, receding worker's rights, racist stop and search, misogynist banter, impunity of the privileged, the 'unflinching polarisation of Britain' (Ferguson, 2004), so that Disney (etc) as Baudrillard predicted:

wins on yet another level. Not content with obliterating the real by turning it into a 3-D, but depthless, virtual image, it obliterates time by synchronizing all periods, all cultures in the same tracking shot, by setting them alongside each other in the same scenario. In this way, it inaugurates real time-time as a single point (Baudrillard, 2000:166).

The airbase in the headset is reminiscent of the ruined domain Dillion evokes, "a melancholy world in which, as Adorno put it, "no recollection is possible any more, save by way of perdition; eternity appears, not as such, but diffracted through the most perishable.'" (Dillon, 2004/5). Beyond this ruined world with its abandoned chronologies, its pastiche and nostalgia, there must be better ways of being we have not imagined or represented yet? Rose writes critically of 'the idea that the latest generation platform presents reality without mediation or construction', adding: 'as VR meets nonfiction today, Bazin's myth of total cinema is again at play when people talk of 'being there' as if present at events represented in VR' (Rose, 2018). But our virtualities need not be those of Capitalist Realism, inevitable neo-liberality or *end of history* discourse, with its intractable hegemonies, making VR a valorising technology, reinforcing the status quo by claiming it mediates the world as it has to be, as *reality*. In the forest, in the headset, glowing lights appear, out of the hovering burial ships there's an end to permanent crisis and austerity, imitation and pastiche, the lights tell us 'we don't have to live as we presently do' (Whyman, 2019).

In *War and Cinema*, Paul Virilio wrote that 'From the original watchtower through the anchored balloon to the reconnaissance aircraft and remote sensing-satellites, one and the same function has been indefinitely repeated, the eye's function being the function of a weapon' (Virilio, 1989:3), but our apparitions need not be weaponised, valorised or homogenised. The lights in the forest, in the UFO horror-folk imaginary remind us we can imagine forward, project ourselves into the past, to how things might have been, to what 'capital must always obstruct: the collective capacity to produce, care and enjoy...the production of common wealth' (Fisher, 2018).

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Abstract

The processes of developing virtual reality (VR) experiences for job training, education, communications, entertainment and the arts have aligned with practices in the fields of film and animation production, game design, fine art, scientific visualization, theatre, psychology, neuroscience and more. Reviewing the critical findings and experiences in various fields of VR research and practice, including their own, the authors seek to identify synergies between fields for designing engaging experiences. We review the practices in other fields and describe our experimentations with the process of developing VR experiences through a devising process rooted in an immersive theatre dramaturgy that is focused on interactions between a participant and a live actor embodied as a virtual agent. Immersive theatre dramaturgy focuses on developing tasks, actions and interactions, both physical and social, for all involved parties. This provided an opportunity to focus equal attention on the interactions between actors, participants, environment, script and realtime technology, which may be useful for prototyping VR participant's actions, simulating environment interactivity, shaping the structure of the experience in time and relationship to a possible narrative world.

Keywords: virtual reality, immersion, presence, interactivity, devising, live avatar, virtual avatar

DEVISING INTERACTIVITY IN VIRTUAL REALITY INFORMED BY THE DRAMATURGY OF IMMERSIVE THEATRE PRACTICE

Introduction

The recent leap and heavy investment by hardware companies in the quality and availability of virtual reality (VR) technologies is fueling renewed interest in the medium. Significantly, the various fields of practice, researching and implementing VR technologies is wider than ever before. The processes of virtual experience development for job training, education, communications, entertainment and the arts, just to name a few, have aligned with the practices in the fields of film and animation production, game design, art, scientific visualization and others, each contributing diverse expertise in designing environmental, interactive and narrative aspects. With our own practice rooted in the multidisciplinary culture of a computing center for the arts and design, the authors of this paper seek to understand a potential for synergy and driving forces in developing most engaging virtual experiences. Based on the experimental collaborations with colleagues and students from design, architecture, dance, theatre, animation, gaming, creative writing, painting, sculpture and interactive media, we find ourselves most intrigued by the process of developing VR through the devising dramaturgy focused on interactions between a participant and a live actor embodied as a virtual agent. The resulting experiences have most in common with immersive theatre but the format can be relevant to other contexts and applications both as an outcome goal or prototyping and development process. At the center of theatre dramaturgy is the focus on developing tasks, actions and interactions, both physical and social, for all involved parties. This includes interactions between actors and audience as well as between the actors themselves, which allows to prototype and simulate user or individual audience member participation. This quality of a dramaturgical

process holds relevance to the VR medium as it is positioned to simulate these same forms of user engagement without the limitations presented by other forms of media. The dramaturgical process of devising allows for the experience to develop in equal response to all components of the production: from environment/set to script to improvised dialogue to real-time technology.

Immersion, Presence, Interactivity

It is widely considered that the three fundamental interrelated qualities of virtual reality are immersion, presence and interactivity. Presence is defined as a "sense of being in an environment" (Steuer 1992). This definition proposed by Steuer is grounded in the ecological perspective on environment offered by psychologist JJ Gibson as not a physical environment but what an organism perceives, what forms a mutually complementary relationship with an organism (Gibson 1979). Considering the opportunity for social presence in VR, Biocca establishes its definition as a "sense of being with others" (Biocca et al 2003). Giannacchi reminds that the concepts of environment and organism are interdependent. An environment constantly changes and co-evolves through interactions with an organism, which points at the ecology rather than a 'place' or 'location' as the locus of presence (Giannacchi 2012). Presence may be established through performativity of transactions between the environment and the organisms within it. In the case of social presence this can emerge in the process of performed communication and co-location with other social agents. Interactivity is understood as an ability to modify the VR environment in real-time (Steuer 1995). But in addition to navigating the space and manipulating objects, Naimark points out perhaps the most important

distinction of interactive media, including VR: a participant's ability to transform the outcome of an experience, which is impossible within literary, film and many other mediums (Naimark, 2016). While an experience may feature overarching goals, from the influential work of the psychologist Mihaly Chiksentmihaly we know that activities can be seen as having intrinsic value in and of themselves (Chiksentmihaly 1990). The sense of enjoyment comes from the balance of challenge and skills and the sense of control over the execution of a task. These concepts have been embraced by many game and interactivity designers in constructing systems of rewards and incentives for continuing engagement with an interactive experience. Dixon offers a valuable model of classifying the progressive engagement levels of interactivity in media applications: navigation, participation, conversation and collaboration, which will be discussed in context later in this text (Dixon 2007). It is also worth adding to this overview a distinction between sensory and cognitive interactivity, that can be used to distinguish between the interactivity of color and sound variations driven by video tracking of a participant's location and interactivity that involves more complex tasks.

Immersion is an area of the most diverse interpretations among the different practitioners. The branching of opinions extends in three dimensions: technological accommodation of the sensory modalities, psychological state of sensory perception and cognitive or content-based engagement. Slater and Wilbur formulated the concept of immersion as "description of a technology... and... the extent to which computer displays are capable of delivery an inclusive, extensive, surrounding and vivid illusion of reality to the senses of a human participant" (Slater and Wilbur 1997).

Witmer and Singer understand immersion as "a psychological state characterized by perceiving oneself to be enveloped by, included in, and interacting with an environment that provides a

continuous stream of stimuli and experiences." (Witmer and Singer 1998) Both approaches recognize as important the blocking out physical reality, representation of self, natural modes of interaction and movement. Ultimately both schools of thought see successful immersion as a prerequisite to creating presence and both can be seen as an influence on the driving considerations in creating VR experiences.

The third consideration of immersion comes from the notion of being immersed into the narrative content or the storyworld. Ryan reminds: "If developers of VR compare their technology to being caught up in a story, literary theorists could profitably return the favor by regarding the text as a virtual reality. Even before the term "virtual reality" became fashionable, this approach has been taken by a school of literary theory inspired by the philosophical concept of possible worlds" (Ryan 1999)

A very productive discussion is held throughout her writing about immersive theatre by Biggins who points at the importance of separating imaginative participation, functional participation and explicit interactivity with designed choices (Biggins 2017) in order to arrive at a synergy of narrative and environment content and action. Balancing engagement on all three levels is not a trivial challenge.

Technological Immersion

Consumer grade virtual reality platforms such as Oculus, HTC Vive and others allow users to experience high quality visuals, utilize natural movements of hands, upper or even full body, to interact with virtual characters, props and environments, engage in several types of navigation and manipulation, experiment with various forms of virtual self-representation, experience a sense of virtual touch.

Not only has the immediate visual and audio-based VR technology become more accessible, affordable, comfortable and robust, it also

has benefited from the co-evolution of other technologies. With varying degrees of cost and accessibility, they open new opportunities for VR experience development in general and integration of robust avatars in particular. Motion capture technologies, ranging from the higher end Vicon and Optitrack to the indie level Perception Neuron and Rokoko, facilitate recording and real time remapping of human and animal movement to virtual characters, elevating their behavioral realism. Real time 3d gaming engines, such as Unity and Unreal offer free platforms for developing immersive and interactive experiences. 3d scanning software and hardware, encompassing basic photogrammetry as well as highly accurate laser scanners, can significantly shorten the time for recreating photorealistic living and inanimate objects in a virtual form. Artificial intelligence has become part of each of these technologies as well, along with making advancements in natural language processing, speech recognition and generation, expanding the design possibilities for social interactivity inside the virtual worlds.

While these technological developments have jump-started the new cycle of VR development, the shaping of the medium itself and the practices of making virtual experiences have been fueled by several creative and non-creative fields. Although the authors intend to focus on the VR experiences in the context of the arts, we embrace and rely on the insights that came from decades of VR based research, particularly in the fields of psychology, medicine and professional training. We are also mindful that the research in the field of neuroscience has been influential in the sheer development of VR technologies which would not have been possible without the foundational research of perception and sensory integration in the brain.

The authors' combined creative practices are rooted in the disciplines of theater acting and media design, performance, computer animation, moving image, human motion studies and related creative technologies. Since

narrative plays a distinctive role in these fields, special attention in our work and writing is given to the relationship of storytelling and virtual reality experience, if not for the sake of plot development per se, but at least with the goal of understanding the possible approaches to structuring a multi-event virtual experience in time.

Experiencing Story in VR

Immersive film and animation makers have taken on the VR challenge to enrich the habitual experience of narrative and spectacle in the cinema format by offering a way to completely surround the viewer with scenery and action, yielding the partial or entire control over camera movement. The aspiration to increase viewer's agency in the film has hardly been resolved as many questions remain: the language of cinema with its conventions of camera movement, framing and transitioning between the scenes has to be almost entirely reinvented. While the evolution of the new conventions is still unfolding, the biggest challenge of directing viewer's attention is complicated not only by the expanded field of view but also the presumption of viewer's navigation in the case of room scale experiences. The previous line of experimentation with film interactivity via branching narrative relied on creating a controllable structure for guiding the viewer. The newly acquired freedom of navigating a movie scene is still to be harnessed for the purpose of creating synergy with the action of other characters, lighting, sound and other moving parts of the scene. Among the early experiments in the current wave of VR revival was Google Spotlight Stories Studio, specially formed for the purpose of exploring animated storytelling for mobile and higher-end VR platforms. The studio produced a series of short immersive 360-degree animations and music videos, such as Pearl and Age of Sail. Witnessing a breath-taking spectacle of a surrounding open ocean in Age of Sail or feeling the family-like closeness of the confined car interior in Pearl has heightened the experience of the environment in the respective narratives. The films received

several awards for creative innovation, but this success did not establish a thriving art form that continues to exist in the mainstream.

“Story is king” is a famously proclaimed motto guiding the creative endeavors at Pixar animation company. Pixar rolled out the Coco VR experience accompanying the release of their feature animated film Coco. Known for their animated shorts, released as companion pieces to almost every new feature film, Coco VR was not a storytelling experience in itself but a guided tour of the artistic and cultural inspiration behind the visual style and plot of the film, grounded in the traditions of Mexican culture and paintings of José Guadalupe Posada.

This choice to experiment with an exploratory VR experience without a plot was unequivocally summarized by the Pixar founder Ed Catmull: “VR is not for storytelling”, referring to the decades of “failed linear narrative experiments in VR” and suggesting that VR is best suited for creating games or experiences (Catmull 2015). The closing of Google Spotlight Studio perhaps served as another testimony of Catmull’s statement.

We strongly believe that, in time, the language of immersive film will evolve powerful equivalents to scene cuts, transitions, and framing, allowing the art of cinematographic storytelling to blossom in the immersive format. At the same time, it is becoming clear that immersive film and virtual reality may not be considered the same medium until the richness of VR interactivity has found ways to support the imaginative participation without disorienting the viewer.

Gaming Approach to VR Immersion

Let us turn to the genre of VR that truly thrives on interactivity. Digital gaming has found the virtual medium to be a natural fit: Czech indie marvel Beat Games has won awards for a simple yet well designed Beat Saber game of slicing 3d shapes that come at a player in the rhythm of

their favorite tune. One of the world’s leading game companies, Valve, spent three years developing VR shooter game Half-Life: Alyx, a VR edition of their Half Life game lineage. Experiencing the game from the perspective of a female character, Alyx, inside a familiar dystopian setting of the Half Life world, one spends time exploring and rummaging through the richly detailed streets, abandoned interiors and sewers, infested with alien life, in search of munitions and clues, as well as fighting various enemies, all a rather predictable endeavor. The well-crafted embodiment allows for a rather natural coupling of the player’s physical movements with the virtual body’s abilities to navigate and manipulate objects. This feels like a first-person experience until one hears Alyx conversing with the other characters in the game. While not stunting or making the player feel ghost-like, it is a reminder that the player is living out the events of someone else’s life. As Adi Robertson points out, VR here is utilized in a way that makes the character “feel messy yet not artificially clumsy” as well as “very skilled but fallible”, in other words human-like in their imperfection. Interestingly, the experience has a strong sense of happening in the present (Robertson 2020). On long stretches of solitary travel, one overhears Alyx uttering her inner thoughts, although not memories. Witnessing “from the inside” the occasional dialogues with the other characters sheds light onto the personality that one embodies in the game. At a certain point of the game one may even wonder what their reflection in a mirror would look like, but the player is only briefly able to see what their embodiment looks like from a third person perspective at the very end of the game.

The experiences of encountering other characters inside their post-apocalyptic dwellings and secret labs is where the core narrative development of Half Life Alyx takes place. Through the preset dialogue, the player receives an acknowledgment or a brief summary of what they accomplished on the previous leg of the journey. They are also able to learn about

the goals for the next stage of their adventure as well as learn more about the events that preceded or simultaneously unfold in the larger world of the game. As a player one is co-present with another character, is free to approach them and position themselves anywhere in the shared space. The participant’s immediate presence is acknowledged through occasional verbal comments on an object that is picked up, prompts to accomplish small tasks or to look directly at a certain point of interest. Not only this contributes to the sense of agency in the experience but also encourages continuous exploration as part of the gameplay.

Advancement of the plot purely through witnessing other characters can also be found in a few other VR experiences, such as The Invisible Hours from the Spanish game developer Tequila Works. Billed as a video game for distribution via the Steam store this experience is hardly a game. A murder mystery virtual play allows one to investigate the murder plot while invisibly shadowing a character of their choice. The player can do this while traveling freely not only around the environment of the game but also its timeline, since the time can be stopped, advanced or rewound for each of the characters. While there are achievements to be unlocked for identifying murder clues, they do not make a big influence on the outcome of the game, with only two possible endings. The main point of the experience seems to be theatrical spectatorship without a possibility of shaping the development of the plot.

Gaming VR experiences seem to be a fantastic fit for designing intrinsically rewarding activities based on the principles of flow and natural interaction. Incorporating a system of achievements and rewards to motivate player immersion also works very well for the medium. The use of gameplay is an effective way to customize the experience of time and narrative. It is a commonly understood way of providing a broad framework and rationale for setting the goals of a game. It is unclear,

however, whether experiencing the narrative nuance would be any more possible in VR than in regular digital games, especially in the context of rigid rule and choice structure which has the potential to stifle the freedom of natural movement and spontaneity of action.

Self as a Narrative in VR

Perspective taking is another type of VR experience that sometimes is supported by a narrative structure. The plot can be as simple as a series of connected events or episodes from a person’s life, in some cases focusing on historical events or figures. Such is I am Man, created under the direction of Derek Ham at the North Carolina State College of Design. The experience places one in a body of a Black sanitation worker during the 1968 Memphis Sanitation Workers’ Strike and witness the events leading to the assassination of Dr. Martin Luther King, Jr. Most of the narrative content itself is delivered via playback of historical radio and television recordings. The optional interactions during the experience allow picking up and emptying a garbage can into the back of a garbage truck and, in another episode, picking up and examining newspapers and other items in the room of the Lorraine motel. Every time one catches a glimpse of their hands during I am Man they cannot help noticing their dark skin, the only subtle and yet powerful element of their virtual embodiment. Another academic project, Becoming Homeless from Stanford University’s Virtual Human Interaction Lab was created for the purposes of research on attitudes towards homelessness in the city of San Francisco. The player, (although this term already begins to feel out of tune), embodies several episodes from the life of a person who loses a job, is forced to sell off their possessions and finally ends up living on the street. There are simple actions that are afforded in each episode: choose an item to sell, move your backpack away from a suspicious person on a bus when it becomes the only place where you can catch some sleep.

A pioneer in virtual reality-based research in the field of psychology, Mel Slater has collaborated on many fascinating immersive VR perspective-taking experiences, ranging from body swapping to being Vladimir Lenin. Truly inspiring insights have been recently achieved on a study exposing a group of males with a history of domestic violence to a virtual experience of being a victim. As Seinfeld et al recently wrote on the efficacy of VRrespect.me: "Using a combination of virtual reality and fMRI, our work reveals how first-person perspective (1PP) embodiment increases identification with the virtual victim during the experience of domestic abuse. We showed that when participants are embodied in the virtual victim the fronto-parietal brain network responsible for the representation of the bodily self and its surrounding space showed highly synchronized activity across participants when experiencing domestic abuse. Moreover, in this condition proximity of the aggressor strongly correlated with neural synchronization of the amygdala" (Seinfeld et al 2018). As a result, the abusers who previously had a lower ability of recognizing fear in the faces of their victims, were able to experience themselves as a victim, both in a sense of physical body and emotional response.

This branch of VR arguably holds the most intriguing promise of a narrative experience as it relies on the function of participant's memory to form a unique story reflecting upon their virtual interactions. Being granted a central character role in such experience, the participant is engaged in the process of constructing a self-narrative based on the sequence of actions and tasks they performed. This process is inherent to the nature of our mind, according to the narrative theories of self. It is what we do to distill meaning and agency from our actions, as Schechtman writes (Schechtman 2011).

Performance Art in VR

In her VR performance art experience, *Rising*, Marina Abramovic invites the participant to

touch, virtually, the hand of the artist trapped inside the glass tank rapidly filling with water. The hand is pressed against the glass wall of the tank. Facing an allegory for melting ice and rising oceans, the viewer is free to extend or withhold the gesture of empathy, acknowledging their co-presence with the artist in the world affected by the climate catastrophe and shared responsibility for its future. This simple affordance, an open ended opportunity for a specific action, may arguably represent the biggest promise of virtual reality: to experience an ability to choose how and whether to act within the virtual world and by doing so transform it and/or themselves. The action of touching the glass may not be real from the haptics standpoint but the decision to do so is just as real as experienced in the physical world.

The power of VR to transport to different environments is still important and true, but, after all, has that not already been addressed by immersive film, installation and interactive art? From the static immersive installations by such artists as Ilya and Emilia Kabakov to the dynamic spaces that incorporate kinetic sculpture, film or animation projections in the world of William Kentridge, such as *The Refusal of Time*, or the immersive concrete animation spaces of Carol MacGillivray, these experiences brilliantly invoke a sense of place. From the analog sensory interactivity of mirrors in Yayoi Kusama's *Infinity Rooms* to the interactivity of real-time video installations, the opportunity to act in a complex sequential manner within an art installation is still typically limited. The kind of sensory interactivity that one experiences here may randomly generate a form, alter a color or sound. It is driven by one-to-one mappings of touch or body motion to a range of visual or audio outcomes. The complexity of such type of interactivity may increase through combining movement of multiple limbs or participants but rarely offer controlled sequential build up over time. These experiences often rely on the viewer's ability to navigate around the space of the artwork, yet they rarely offer diverse or sequential

manipulation of the elements of the environment. To a large extent this is dictated by a necessity of preserving a repeatable experience for multiple visitors. And to some degree there is perhaps an unspoken anticipation of the amount of time and commitment expected from the viewer to engage in the experience. In contrast VR affords each participant an equal and repeatable opportunity to transform the virtual space and their own self through actions that can range in the complexity of goals, spatial and temporal structure and degree of imaginative participation.

Acting, Perceiving and Imagining Action

If immersion is essential to presence, it appears that interactivity is a necessary condition of immersion insofar that the ecological approach prescribes interaction with an environment to learn how to function within it. While understanding the environment is beneficial, it is not essential, and creating its mental representation in order to operate within it may not be necessary. This after all is the condition which we all have experienced as young children. As mentioned earlier, one of the definitions of immersion in VR was inspired by the work of the unorthodox psychologist JJ Gibson on ecological perception of the environment. Gibson understood visual perception to be inseparable from action, and vice versa (Gibson 1979). We perceive in order to move and move in order to perceive. Perception relies on environmental affordances - opportunities for action - which are detected unconsciously. For instance, the brain does not need to have a full physics-based model of gravity and run computations every time one must catch a ball. We make quick decisions to sit on surfaces, pass through narrow passages, grab handles without much conscious thought as to whether they will hold our weight, accommodate the size of our bodies or whether the doorknob will actually turn and allow us to open the door. Although still heavily debated, Gibson's viewpoint and the concept of optic flow have been greatly influential in such

highly functional fields as computer vision, robotics and virtual reality. Framing immersion through action, this line of thinking inspires us to look deeper into the nature of action and its consideration in relationship to VR interactivity.

It is established that perception and action are closely intertwined and rely on the same common coding system that allows the shared processing and control of our movement - we perceive in order to act and act in order to perceive. Acting physically or mentally as well as perceiving action is processed by the same areas in the brain and is prioritized over higher cognitive activities.

When considering vision, which constitutes the largest portion of the total sensory input according to Jerald, the two perceptual visual pathways in our brain help to process what we see. The dorsal pathway, often referred to as the "where and how" pathway is responsible for processing location and motion information. The ventral pathway is referred to as the "what" pathway and helps us identify phenomena, objects and their features (Jerald 2015). They do not work in isolation, and when we grasp and manipulate an object, for instance, the dorsal pathway incorporates the input from the ventral pathway to identify the features of objects that could allow for its improved handling (Polanen and Davare 2015). The full spectrum of functions and relationships between the two neural pathways is a subject of ongoing research. For instance, Goodale proposed that that perception and action are associated differently with the two neural pathways: the dorsal pathway is more responsible for the visual control of action and the ventral for the visual perception (Goodale 2014). Dorsal visual pathway works faster than ventral and is the first one to react when we encounter an object in our close proximity, aka the peripersonal space. Coello et al found that the ventral visual pathway is slower and is more active in processing the appearance of objects in the distance, out of reach (Coello et al 2018). Without claiming

deep scientific insight, one can still find this potentially relevant to designing a room scale experience with a lot of affordances situated in the immediate reach of the participant. How distracting will these possibilities be for exploration and manipulation? How to harness this tendency of our attention to support a narrative or another type of imaginative participation or cognitive engagement?

One insight in which action has the capacity to influence cognition comes from the research by cognitive linguists George Lakoff and Mark Johnson on conceptual metaphors. Looking at the utilization of verbal constructs such as “jump to conclusion”, “life is a journey”, “close friends” or “cold reception” they proposed that the brain processes those concepts by embodying them via activation of neural pathways controlling physical actions or perceiving phenomena affecting the body. Translated into the language of the brain those concepts would rely on mental replay of physical jumping to quickly cut to a point in space, mental visualization of space as time in order to treat time as a line in space, perceiving intimacy as closeness and affection as warmth (Lakoff and Johnson 1999).

First observed in the use of language, subsequent studies proved that neural reusing transcends verbal domain. For example, Casasanto and Boroditsky reported that the part of the brain involved in spatial processing is also utilized in operating with the concept of time in non-verbal tasks (Casasanto and Boroditsky 2006)

Lastly, Shpancer reminds that action is capable of directly shaping emotion (Shpancer 2010), allowing an activity to influence one’s mood, which supports the aspiration for VR to design affordances that enhance the emotional experience of the participant. In summary, it seems that the consideration of activities that participants can engage in is far more important in a VR experience than that in other mediums, if not the essential aspect of VR design. Not only does it matter for the

sake of creating a psychological state of flow. More critically, further consideration must be given to the potential of explicit interactivity to distract from imaginative participation, at least in the immediate experience.

Enter the Avatar

A participant can discover opportunities for simple actions by exploring an environment. They can also be revealed through naturalistic or artificial aspects of environment design, such as layout, lighting, color coding or motion. More complex sequential actions and tasks may be more difficult to uncover and are often revealed through larger narrative framework, instructional text, or communications with virtual characters. Brave and Nass point out that interaction with virtual humans and animated characters is not only functionally helpful but also more engaging than interaction with inanimate objects (Brave and Nass 2009). Even pre-recorded performances of virtual characters driven by motion capture or animation hold the capacity for guiding and framing participants’ experiences. But the greatest sense of presence is achieved through the interaction with characters performed by live actors, who can engage the participant in conversation and collaboration, the most engaging forms of interactivity, according to Dixon’s taxonomy. Los Angeles based studio Tender Claws employed live actors to engage viewers in direct improvised interaction with the characters in what journalist Todd Martens described as a virtual reality vaudeville, *The Under Presents*, where he reported to have spent over 20 hours hanging out with live avatars of humans, cats and tiny skeletons, among others, who danced with him, taught him spells or simply gave hugs, an experience particularly heightened by the onset of the coronavirus quarantine (Martens 2020).

Such VR experience is akin to immersive or participatory theatre and its approach holds intriguing promise for a variety of applications

in art, entertainment and education, to name a few. We believe that the existing development methodology established for these forms of formalized theatre are highly relevant to VR experience development. We recommend further research looking along these lines be undertaken urgently and in greater detail.

A comprehensive framework that is relevant to approaching VR design as a theatrical experience is given in the previously mentioned Biggin’s analysis of immersive theatre applied to the practice of Punchdrunk theatre group (Biggin 2017). Punchdrunk is well known for their active promenade plays where the audience is free to meander around a location with the scenes of a play set up in separated spaces. The multiple pathways, the order of discovering each scene and the pacing of the journey allow each member of the audience to unearth the story through plots assembled uniquely to each participant. Not only the audience is free to navigate around the space of the play, they can also interact with performers through action and dialogue. The audience members perform a role of themselves and during some shows wear masks concealing their identities. The theatre group also stages performances as part of outreach and enrichment in schools, community, and cultural spaces.

Biggin draws on the concepts of immersion, presence and interactivity, as well as game studies and narrative theory to discuss the immersive theatre model. Immersion in Punchdrunk plays is facilitated through surrounding the audience with multisensory scenography that incorporate the architecture of buildings, low level lighting, distributed sound and, occasionally, cinematographic projections. The contribution of the scenography (or environment design) to the sense of presence is enhanced by the performative interaction of the actors among themselves and with the audience. Biggin parallels the flexible experience of the story in the play with the interactivity of a gameplay. She points to the

dramaturgical challenges such as communicating the opportunities and limits of interaction with the space and performers and mentions some of the barriers to the immersion, such as audience disorientation, choice paralysis, lack of empathy and anxiety, related to the anticipation of having to perform in a state of disorientation. All these considerations are extremely relevant in planning social interactions, environment layout, lighting, sound and other elements of a VR experience as well as its hosting site in the physical world.

Experiments with Performance, Interactivity and Narrative Elements in VR

Our own practice-based research perspective is refracted through sharing the creative space and process with disciplines such as art, design, theater, computer science, dance, creative writing, architecture, art history, music and others at the Advanced Computing Center for the Arts and Design (ACCAD) of the Ohio State University (OSU). Through informal studio workshops and experiments, interdisciplinary course collaborations, and artist residencies we have been fortunate to approach VR from the perspectives of several disciplines. This writing has evolved reflecting upon this practice. The only parameter that we committed to from the beginning was the use of motion capture for live and recorded performance within VR, which implied incorporating realistic and stylized anthropomorphic characters and puppets.

Prior to working with VR, ACCAD has collaborated with the OSU Department of Theatre on a number of plays that explored the process of devising with sensing technologies, projection mapping and live motion tracking. The project, most immediately preceding our dive into the virtual medium investigation, was a play *There is No Silence*, focused on the life and work of the French mime Marcel Marceau, which encompassed his practices as a performing and visual artist. The development of the play was led by Marceau’s protege Jeanine Thompson, a faculty member in the The Ohio

State University Department of Theater and one of the major living holders of Marceau's legacy in the United States. In addition to several archival film, video and print materials held at the Theatre Research Institute at OSU, we also had at our disposal a unique set of performance capture data that was acquired when Marceau himself performed in our Motion Lab in 2001.

Motion capture was not only integrated in the play as a novel technology but also as a reference to Marceau's being one of the first performing artists to commit his work to this form of historical preservation. The archival motion captured performance was included in a play in a form of screen video projection. It combined Marceau's movements visualized as an abstract figure, co-located with another avatar, driven in realtime by the performance capture of Patrick Wiabel, one of the then Acting MFA cohort students, who devised the performance as a live choreographic dialogue with the archive performance material (Figure 1a). Before the start of the devising process we experimented with the integration of live full body and facial motion tracking, live silhouette, animation and film projections, most of which were retained as technology components of the show. During these preliminary workshops we found that making the presence of a live actor and their virtual avatar visible to the audience in the same performance space was an engaging way of framing the connection of a present day performer with both Marceau's movement and visual style of the imaginary worlds in his prints (Figure 1c). Giannachi provides further support for the dramaturgical approach of co-locating physical and virtual performance and reports greater engagement for the audience in the experiments with avatars in the context of cave VR (Giannachi 2011). When the first of the newer virtual reality head mounted displays (HMD) became available we have run our first experiment with experiencing virtual performance by incorporating Marceau's performance data in a simple VR app allowing to control the playback of the recorded adagio

and navigation around the figure moving in the peripersonal space, of the viewer. Marceau's movements were rendered in a transparent neutrally stylized biped form for the sake of clear visibility of gestures regardless of the viewer perspective (Figure 1b). Whether it was the transparency of the figure or the way one perceives human scale movement in their personal space but the co-presence felt ghostly yet somehow more human than an imaginary animated character. This informal observation reaffirmed our commitment to developing virtual experiences with an integration of recorded or live performance.

We conducted a series of small collaborative workshops investigating the type of interactions that are facilitated by a live performer in VR, featuring two virtual characters, one of whom was pre-recorded and one performed live by an actor. Both recorded and live performances were done by the same actor to explore the process of devising possibilities for the live avatar to facilitate interaction between a VR participant and a pre-recorded character. In the experiment based on the graphic novel *LightStream Chronicles* by Scott Denison, the live avatar became such liaison between the participant and the pre-recorded character (Figure 2b). It was the recorded performance that set the temporal structure of the experience, by creating the events which the actor had to anticipate while guiding the participant. In parallel we also explored a short experience *Paperworld* where the live actor puppeteered a non-human character and the participant had a chance to interact with several physical props that served as haptic feedback for the virtual objects in the scene (Figure 2a). Since it was possible to place optical markers on props as well as performers, it was possible to track objects the size of a hand and larger.

Our work continued within an interdisciplinary class, Performance and Narrative in Virtual Reality that the authors co-led

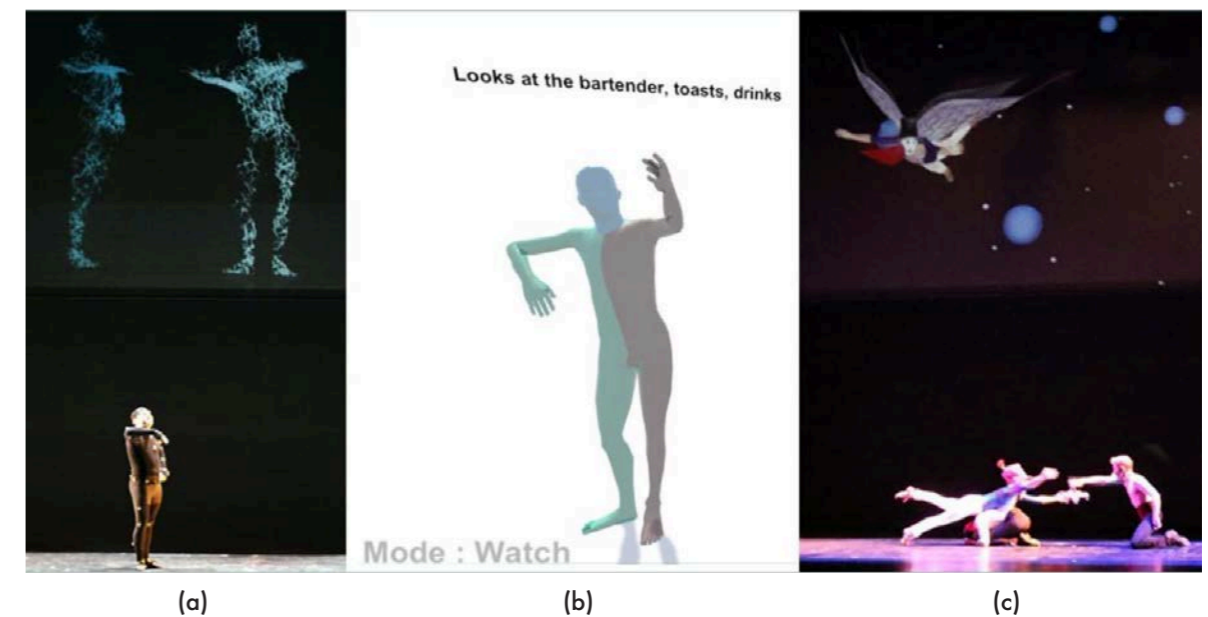


Figure 1. Scenes from the play *There is No Silence* (a) Patrick Wiabel (projection left) in choreographic dialogue with performance data of Marceau (projection right); (c) Co-location of physical action with real-time motion capture driven imagery (above). (b) Screenshot of VR app for studying captured performance of Marceau's adagio *At the Bar*.

together with two interdisciplinary groups of graduate students. The groups were tasked with development of large room scale VR experiences, utilizing an HTC Vive virtual reality system and a Vicon motion capture system, following any creative development process, with the following requirements:

the experience had to feature live or pre-recorded motion capture performance of a virtual avatar or agent, co-located in the same virtual and physical space as a participant while staying within the confines of the same physical area;

at least two different environments had to be simulated over the course of the experience;

at least one virtual object had to have haptic feedback in the form of a physical prop with motion capture markers;

prior to programming, interactivity would be prototyped through human operator

control, triggering changes of environmental elements through keyboard;

There was no prescribed protocol for approaching the development of the experience. We were curious to see what the students, most of whom already had professional experience, would bring from their fields of practice that could inform the creative process. As a starting point we have embraced the methodology of iterative design as an existing recommended process of VR development. Writing about iterative design as the best type of process for VR development, Jerald encourages designers to give up the idea of planning and rationalizing the entire experience in the beginning, testing and adjusting frequently instead with the constant focus on the user experience (Jerald 2015). This was already a familiar practice for those in the group who came from the design background. The designers and artists also had the experience of working with 3d computer graphics, which meant that the virtual objects,

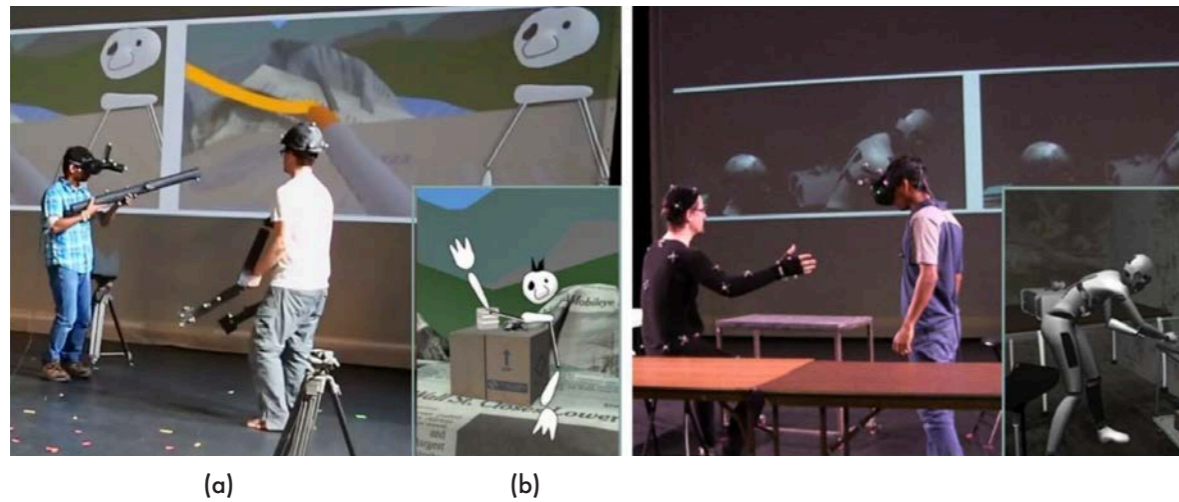


Figure 2. Experiments with live performance in VR (a) puppeteering and props (b) Live actor in mocap suit mediating between the participant and the recorded performance embodied as a cyborg avatar

3d assets, were mostly made from scratch rather than downloaded off the internet. Right away this manifested three dominant aesthetics features: photorealism, imitation of the mainstream computer animation stylization such as that of Pixar or Dreamworks studios, and simplified, low-resolution models of simple video games.

Since a few students were interested in upgrading the process of storyboarding, a traditional planning step in animation and film, they chose to work with a VR action layout template that allowed them to sketch action plans in the entire space surrounding the user.

The design-centric term “user” in itself became a subject of discussions around the evolution of VR culture. Since only one person could wear HMD and be immersed in the experience at any given time, referring to them as an audience and even “audience member” seemed awkward. The term “player” was commonly used, perhaps as an influence from a video gaming hobby shared by most students and in part as a reflection of an active nature of the experience. Quite likely for the same reason a person immersed in VR was never called a “viewer” or “spectator”. Those with the background in design tended to refer to them as a “user”.

None of these terms seemed quite fitting so eventually we settled on the term “participant”.

The resulting experiences emerged as a guided journey with at least two sequential scenes that happened in different virtual settings. The technological capacity of VR allows us to host different virtual environments in the same physical space. Branching or sequential narrative structure permitted the participant to determine the course of their environment exploration and role playing in each scene. Users were guided through the experiences by a live actor who performed different characters in different scenes. In the same technological fashion as swapping virtual scenography in the same physical space, the embodiment of the same performer would manifest as different characters.

Sometimes other characters were co-present in the scene in a pre-recorded form, allowing the live performer to frame their presence as interactive. All of the experiences were based on scripts with various degrees of action detail and reliance on verbal dialog. To accomplish this required great flexibility on behalf of the performer so their expertise in improvisation was paramount. They guided the participant

through the experience, prompting verbal responses, directing the gaze, providing hints and clues, and accommodating any variations on the anticipated questions and answers coming from the participant. The process of development turned into a very collaborative one for the students (Figure 3).

The Tales of Mount Gasmoor took a participant on a journey to a remote village haunted by a dragon. After getting to the village by boat, the participant navigated around several village environments and ran into several villagers. During each of the encounters the participant found out the choices for the next leg of their journey, which was determined through a conversation and choices of virtual objects. The experience came to an end when the participant either killed the dragon or managed to harvest its noxious gas to power the electricity in the village. This whimsical journey of approximately twenty minutes featured elaborate scripted monologues that gave insights into both the history of the village’s predicament and personalities of the villagers. While performing a monologue the actor had the freedom to deviate and improvise answers to the questions or actions of the participant.

Entering the virtual world of *The Ghost*, a participant found themselves in an empty parlor with furniture and simple decorative objects.

The narrator’s voice informed the participant that the parlor was haunted and in order to release the ghost, the visitor must uncover all objects that were connected to the former inhabitant of the house. While being picked up and held by the participant, an object: a candle, an old record, a cup, a picture frame brought about a moment of transformation in the parlor, by making it glow vibrant with color or filled with sentimental sounds of an old gramophone. The group developing this experience were primarily interested in facilitation of haptic feedback so all the virtual props could be picked up since their positions in the virtual environment were matched up with physical props placed in the corresponding spots within the physical space. At first invisible, the ghost, mimed by the live performer, became more and more opaque with each activated object. Although they would occasionally guide the participant towards a particular object, they only communicated through gestures. While the ghost’s presence in the space was critical, the timing of the experience was self-paced by the participant. The actions expected from the participant were simple exploration and manipulation of objects, without any particular tasks.

The Experience of Living with Dementia yielded the greatest observable and informally reported participant engagement of all other experiments. This role playing experience was based on the



Figure 3. Collaborative devising process of developing a virtual reality experience with a live avatar

real life circumstances of Dreama Cleaver, a graduate student in Design with a background in film making, visual and performance art. Cleaver had been a caregiver to her parents who both, consecutively, became affected by different types of dementia. Through the virtual experience Dreama hoped to render an insight into the daily life of a person living with the condition. The live performer played the role of an unskilled caregiver. It was determined from early on that the two virtual environments where the experience would take place would be the kitchen, where the participant in the caregiver just moved to live together, and a nursing home room. The overarching story intended to show the deterioration in the cognitive state of the person living with dementia and their move to a care facility. The design team members with 3d design expertise began working on the environment and character models. Cleaver started the creative process with a simple script that highlighted several events taking place over the course of several months. In the context of each event the participant was asked to perform a simple type of activity, such as put away dishes, look for a photo album in the stack of newspapers, or look out of the window. The activities were prompted by the caregiver avatar. The outcome of each task was unexpected: as the participant turned around after moving dishes into the sink, they would see them reappear on the kitchen table. Their confusion would be reinforced by the caregiver's response: "Maybe you got a little distracted? I asked you to put away the dishes. Could you do that for me?" Some events were happening without any input from the participant. A caregiver would note in passing that they are getting ready for a job interview, and then later, that another job was lost. A couple of times upon an operator's cue, a smoking skillet would appear on the stove when the participant wasn't looking. The caregiver would storm in and react in a loud and emotional way. As the experience progressed the passage of time was indicated through a change of time on the wall clock, calendar, environmental lighting, change of caregiver's

clothes and weather effect on the scenery outside the window. At the end of the experience which took anywhere between 15-25 minutes the caregiver would indicate that the time had come for the participant to go live in a care facility. As the participant and the caregiver walked through the kitchen doorway and turned into the hallway, the environment was reloaded, revealing an entry to a nursing home room where the participant saw two beds and a wheelchair.

The transition in and out of the virtual experience in the physical environment was handled by the performer. They first introduced the experience while directly facing the participant in the real world. They offered the participant to act along in any manner they wish and stop anytime the experience would feel uncomfortable in any physical or emotional way. The performer stepped into the role of a caregiver by helping the participant to put on a VR headset and the participant found themselves in the world of the virtual experience: the kitchen, with a virtual embodiment of the performer as a realistically rendered human. Discovered later in the devising process, an effective way of determining the relationship of the caregiver and the patient was to allow the participant to choose it by having the performer ask: "Do you remember me?" Participants could determine the caregiver to be a particular family member, some identified them as a friend. At the end of the experience the caregiver asked the patient to sit down in a wheelchair and said goodbye, implying that the participant is to stay in the care facility while the caregiver went to work. They asked whether they could assist the participant in taking off their glasses and helped to remove the VR headset.

Some connection with the physical world remained uninterrupted. A chair was co-located as a physical and virtual prop, to accommodate participant's sitting at a virtual kitchen table. The virtual skillet also had to have a matching physical prop to allow the performer to remove it from the stove. The rest of the virtual interactions were facilitated by hand controllers held by

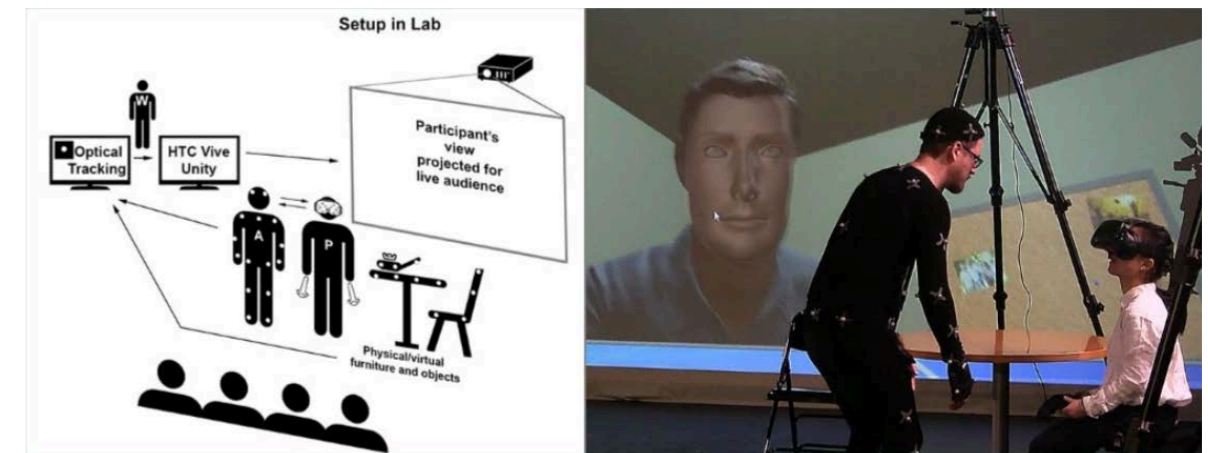


Figure 4. The diagram of the setup for Experience of Living with Dementia and interaction of the avatar and participant

the participant. The layout of the virtual space was marked by spike tape for the performer allowing them to navigate the virtual world that was otherwise invisible in their immediate physical space. The performer also received some cues via a backdrop video projection that was primarily intended for the seated audience that observed the experience. The diagram of the setup and interaction of the avatar and participant can be seen in Figure 4.

Conclusion: Beyond the VR performance

The experiences were primarily developed for a participant wearing the VR headset. In a typical hour long workshop the same experience was offered to two or three participants. As the experiences were developed and demonstrated an audience of observers would always be present. It consisted of university and community members with varying degrees of VR experience and connection to the arts. From their perspective the spectacle was an interaction of a "blindfolded" person wearing the VR headset, in a bare performance space, appearing to be immersed into their inner world that was visible to the audience in the video projection. This became a spectacle in itself that has resulted in engaging discussions following the shows. There was a clear need to discuss the experience, even as it was

observed, while of course it included sharing of their perspective coming from the immersed participants. In our future work we want to expand our focus on the observable spectacle of VR immersion to understand possibilities for the dramaturgy of audience participation.

Reflecting back on the development process, the combination of iterative design and devising dramaturgy allowed prototyping social interaction through improvisational handling of various participant behaviors, environment navigation, interaction with props, etc. Although no artificially intelligent agent would be able to replace an emotional range and nuance of a live avatar, for a simplified experience to be disseminated to a wider audience it would be possible to record multiple avatar responses to various participant choices, perhaps as a branching narrative, and turn this into a fully automated interactive play. In our future work we are interested in exploring the possibilities of evolving the live avatar performance via utilization of remote acting technologies. Although the *Experience of Living with Dementia* was not specifically designed as a theatrical or educational experience, it has evolved into an on-going partnership with the OSU College of Social Work. The existing VR experience will be used in caregiver training. It is also our hope that it can continue to evolve as a platform to develop

further scenarios devised from other caregivers' experiences for the purpose of understanding ways to improve caregiver resilience. As an indicator of such potential, *Designing The Experience of Living with Dementia* had an impact on Cleaver shared in the following words:

"It's really hard to explain to somebody the behaviors of dementia... so I tried to convey that but also try to think of what it's like for the actual person who has dementia, what could be going on in their head... And I came up with that based on my direct experiences as a caregiver and years of watching those symptoms and doing a lot of research. Being able to help other people in my situation is what kind of makes my situation worthwhile." (Cleaver 2019)

It is the capacity of the virtual reality medium to facilitate these kinds of human experiences that continues to inspire our work as well. We also hope to remind and encourage VR developers to pay greater attention to the existing practices that have been evolving the expertise of simulating life, environment and social interaction without the technology.

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Abstract

#RiseandGrind is a research-based artwork that, through a process of active engagement with the machine-learning tools of what is known as artificial intelligence, sought to make visible the complex relationship between the origins and context of training data and the results that are produced through the training process. The project using textual data extracted from Twitter hashtags that exhibit clear bias to train a recurrent neural network (RNN) to generate text for a Twitter bot, with the process of training and text generation represented in a series of gallery installations. The process demonstrated how original bias is consolidated, amplified, and ultimately codified through this machine learning process. It is suggested that this is not only reproductive of the original bias but also constitutive, in that black-box machine learning models shape the output but not in ways that are readily apparent or understood. This paper discusses the process of creating and exhibiting the work and reflects on its outcomes.

Keywords: Twitter; Machine-learning; artificial intelligence; new media art; generative art;

Introduction

#RiseandGrind, is an AI art project using textual data extracted from Twitter hashtags to train a recurrent neural network (RNN) to generate text for a Twitter bot, with the process of training and text generation represented in a series of gallery installations. The work was first commissioned in 2018 and exhibited in three different iterations in 2018 and 2019. The neural network was trained on two selected hashtags, #RiseandGrind and #Hustle, specifically chosen as representative of a Twitter filter bubble that I identify as embodied neoliberal precarity. That is a form of economic self-exploitation arising from an assimilation of the values of the precarious digital gig economy characterized by an adherence to neoliberal principle that economic success or failure is built entirely on individualised effort. In this filter bubble the dedication to the hustle, relentless self-promotion, and dispensing of bland life advice is total, almost to the point of parody; it is also lively, energetic, occasionally ironic and a little anarchic and, in this respect, encapsulates the best and worst of social media. The project sought to make visible aspects of the black-boxed machine learning process, to raise issues of algorithmic bias through demonstrating the training process, and to highlight the role of artistic practice and research in understanding these issues as part of a broader dialogue in addition to exploring their aesthetic potential, particularly as a method for the generation of text. While questions of algorithmic bias are not new and have been widely studied, they are still relevant and unresolved as illustrated by the recent controversy over the training of Open AI's GPT-2 model on Reddit data noted for their strong bias. (Sheng et al. 2019) This text discusses the motivation and process of producing an intentionally biased AI resulting from training on biased filter bubble data, unpacks the process of training a RNN on Google's TensorFlow from a non-specialist

perspective, and rendering this process visible through a series of gallery installations.

Twitter Hashtags

Hashtags are a core mechanism that coordinate the flows of Twitter conversations, dynamically forming and reforming ad hoc publics (Bruns and Burgess 2011) that assemble over news and information, common interests, cultural moments, values, for political debate and activism and more (Murthy 2018), presupposing a "virtual community of interested listeners". (Zappavigna 2011:791) Alongside other categorisation techniques such as location, followings, trending subjects, the hashtag is the "killer app" that enables Twitter's users to consume and interact with tweets from users they do not follow or have location in common with and engage in conversation with strangers on matters of common interest. In addition to organising informational flows, hashtags have been seen to play a role in not only constituting online identities but also in co-producing these network identities, this effect being particularly notable on Black Twitter. (Brock 2012; Freelon et al. 2016; Graham and Smith 2016) However, they also form filter-bubbles, self-referential immersive information environments (Pariser 2011), these can be both mutually supportive communities of special interest and echo chambers where ideological positions are rehearsed and reinforced with little outside intervention, which can serve to reinforce and amplify bias and are subject to automated manipulation from bots.

Hashtags act as method of categorising twitter users and their data for the purposes of surveillance, targeting, and the accumulation of what Shoshana Zuboff calls behavioural surplus. (Zuboff 2019:65) Twitter packages and sells insight on their users through their data

services and offers access to data through their APIs making Twitter a popular source of training data for myriad machine learning applications including sentiment analysis and content generation. These assemblages (Kitchin 2014) of surveillance capitalism target not only the specifics of interests and activities as indicated by followings, likes, retweets, locations, interactions and hashtag activity but, through algorithmic sentiment analysis, opinions and values. The goal of surveillance capitalism according to Shoshana Zuboff is not only one of behavioural prediction but is ultimately to persuade, to nudge and change behaviour based on past actions. (Zuboff 2019:68) The full consequences of building predictive and persuasive models on data that is biased and incomplete, the result of self-replicating internet echo chambers that should not be extrapolated, is only beginning to be fully understood. In the words of Anima Anandkumar, Director of AI Research at Nvidia, discussing the training of Open AI's GPT-2 model on Reddit "when you train on Reddit data, out comes garbage"1

Data Acquisition

The project began with two interrelated hashtags, #RiseandGrind and #Hustle, that are not openly politically partisan or controversial and don't readily fit within social media culture wars, which is not the same as saying that they are apolitical. In fact, I suggest that they are ideological, espousing a value system that emphasises an individualistic self-reliance, where hard work and entrepreneurial hustle are all that it takes to succeed in the neoliberal gig economy. They are representative of an economic world view that I identify as embodied neoliberal precarity; that is a value-based form of self-exploitation that conflates the requirements and economic values of the precarious gig economy with personal identity and self-realisation or individuation, threading a ground that has been previously identified and described as characteristic of the sharing internet economy. (Scholz 2012)

As with many hashtags their usage is complex with irony and sarcasm juxtaposed with naively bombastic tweets. As expected, automated bot activity is evident (Varol et al. 2017) at various levels of sophistication, from crude spam hashtag storms to carefully targeted tweets that pass as human. However, the overwhelming impression is of a filter bubble delineated within these hashtags with a clearly articulated message and a cohesive world view, even if that does not stand up to sustained scrutiny. It is important to note that these hashtags are also lively, energetic, entertaining and fun, in many ways pure Twitter in that they are well-attuned to their medium, in form and content. It was for these reasons that these particular hashtags were selected as training data.

The project began with some questions. What would training using a common language model on a ubiquitous machine-learning platform produce from this data and what conclusions could be drawn from its results? Would traces of the process of training and adjustments to the training parameters produce aesthetic traces that are unique and characteristic of the process - similar to digital artefacts of glitch art - and could the process of making visible these black box processes through the medium of art add to the critical debate on AI and society by adding an additional perspective beyond those of experts in the field?

The Intelligence of Machine-Learning

While I describe this project as AI, I acknowledge that the term artificial intelligence itself is problematic. AI can be more accurately described as machine-learning, the use of convolutional neural networks, recurrent neural networks, generative adversarial networks, deep learning and so forth. Current machine-learning techniques differ from earlier generations of AI with their focus on creating thinking machines to emulate the human brain to create a general artificial intelligence. While this bio-mimetic terminology persists, the techniques are very

different. Machine-learning is a probabilistic method that works with statistical correlations and heavy duty computational power to identify patterns in datasets and encode these into a model which can be used on unseen data to perform its decision making functions; generating text, identifying objects or faces, machine translation and so forth. Despite the anthropomorphic terminology it's not intelligent in a general human-level sense, rather it's a fast, brute force method that can achieve impressive results in narrow domains. (Karpathy 2015; Kelleher 2019; Sejnowski 2020) Machine-learning techniques require high quality data to train the network in a computationally intensive process with the results only as good as the quality of the data input. In many applications, including computer vision and autonomous vehicles, this process often has a Mechanical Turk aspect to it, with automation made possible by workers painstakingly creating training data input by manually labelling millions of images. (Lee 2018) With natural language machine-learning the training data is often, as in the case of GPT-2 the most prominent and powerful language model, sourced from the internet with their inherent bias problems.

Machine-learning systems learn through advanced pattern recognition within very large data sets, with these patterns then encoded into the algorithms - the process of training. These algorithms can then be applied to data to categorize it based on these patterns or to generate new data based on past actions, the premise is that the larger the data set the more accurate the outputs. Of course, this isn't always true, and machine-learning has been found to codify bias, error, racism, and sexism in what philosopher Bernard Stiegler calls functional stupidity or *la bêtise*. (Fitzpatrick and Kelleher 2018) However, the effectiveness and opaqueness of machine-learning systems, tends to militate against the recognition of bias in these systems. As decision making systems based on machine-learning are widely deployed, the flaws in their make-up are

emerging. Recent scholarship has revealed these flaws; racist search engine assumptions (Noble 2018), sentencing systems that discriminate against people of colour (Angwin et al. 2016) even facial recognition cellphone unlocking unable to distinguish between Chinese female faces. (Zhuang 2017) Problems of bias are complex but begin with data, and with a failure to recognise the unrepresentative nature of the data as well as outright bias, racism and sexism in what has been described as "privilege hazard". (Ignazio and Klein 2020:28) However, failures in AI are not always readily apparent and as machine-learning systems are incorporated into all aspects of life the act of discrimination and bias is baked into proprietary algorithms incorporated into larger processes of governance, so that identifying where in a complex process this bias is located is not often possible and actionable. It is against this growing context that this project was conceived.

Neural Network Training

The project began by acquiring a body of tweets with the hashtags, #RiseandGrind and #Hustle. This took place over a period of weeks, the idea was to capture a representation of the hashtags, capturing both historical and current tweets, over a period of time to dampen out temporal fluctuations arising from specific events. In all, this process has been repeated on three different occasions over an 18-month period resulting in a corpus of tweets that demonstrates a broad consistency of usage within these hashtags. This amassed a corpus of approximately 600,000 tweets with retweets excluded from the collection. The proportion of #Hustle to #RiseandGrind tweets was 80% to 20% respectively, most tweets were in English with US based tweets in the majority with Nigeria the second most represented country. Tweets were acquired through the Twitter APIs and saved in a Mongo noSQL database. In addition to the tweet text the Twitter APIs return comprehensive metadata for each the tweet which typically includes 70-80 fields or 250-300

lines of JSON. The tweet text, a single field, was extracted to form the body of training data.

The data was used to train a language model on Google’s machine learning-platform TensorFlow. TensorFlow was selected as a ubiquitous tool for machine learning. Originally developed by the Google Brain team for internal use and released as open source software in 2015 it has become a widely accepted industry standard framework synonymous with deep learning and neural networks. For this work the intention was to train a model to generate the perfect #RiseandGrind and #Hustle tweets, tweets that would pass unnoticed. To achieve this the model needed to identify and extract patterns from themes, subjects, language use, hashtags, retweets, and @ing other users in the conversational flow. Twitter is a fast moving and complex textual environment, where conventions and user practices are not only specific to Twitter as a whole but are more specifically dynamically defined within an array of filter bubbles and conversations that form and reform with implicitly understood rules of engagement. The task of generating tweets that fit within this very specific hashtag environment is not trivial, and for machine-learning, which is excellent at pattern identification but has no semantic understanding, it is challenging. Amongst data scientists training a neural network is often considered to be both an art and a science, as fine tuning of multiple parameters impacts greatly on the quality of the results with over and under training presenting significant problems. Achieving the right balance is an art that comes from experience and intuition as much as deep understanding of the mathematics. For a novice both problems were evident as the data went through a series of trainings with variations in the data-set size, the number of epochs (length) of training and other tweaks to the parameters of TensorFlow. A character-level recurrent neural network (RNN) was employed to model the probability distribution of characters in the body of training data, that is the probability that one character will follow

another, to produce a body of text under 280 characters, character by character. When using terms like artificial intelligence it’s important to remember that the neural network has no semantic understanding, what is actually happening is the network calculating the probability that one character will follow another using the example of the training text. RNNs it turns out are, in the words of data scientist Andrej Karpathy, “unreasonably effective” (2015) in doing this.

Following the Training Process

The training process was logged in order to make visible the process at work, with the system configured to produce sample text at periodic intervals to identify the state of the training process. This log included input text alongside sample output with a value for the network’s confidence that it was correct. In early epochs, we see blank text or single characters often repeating (see Table 1)

The network periodically generates random text from the current learned state (see Table 2) As the epochs progress the text begins to coalesce into words which are typically nonsensical.

TRAINING STATS: batch 0/173 in epoch 0, batch loss: 4.47500, batch accuracy: 0.12733

However, it doesn’t take long before words begin to emerge, and the network begins to hallucinate Twitter handles and URLs correctly formatted with the http://www and @ form even though they don’t correspond to any real address or account. The neural network quickly begins to generate texts that acquire the correct tweet form often in varying styles: long engaged tweets that @ many other accounts, pithy short declamatory tweets, self-promotion tweets complete with many #hustle related hashtags. Early tweets often made no sense but mimicked aspects of the style and themes from the hashtags with many errors (see Figure 1)

However, as the training progresses the output accuracy improves with the form of the tweets

| Training Text | Generated Text | Batch Loss |
|---------------------------------------|------------------------------|---------------|
| d #ironwillfit #fitness #fit | nnnnnn | loss: 4.05692 |
| d\Gameday! #RiseandGrind\#RISE | nnnnnddnnnn nn | loss: 3.53756 |
| the hustle never stops. #RiseandGrind | ennn | loss: 3.10608 |
| her listened to my Rise And Grind | aon #o to #isenAnd iii | loss: 2.15545 |
| Grind #positivevibes #fitlife # | nd \Rosenene one #ooseene #o | loss: 2.43459 |
| #FridayFeeling #FineWomenFriday | iisen #ri nd #iise ar in | loss: 3.13049 |

Table 1: Early stage sample from the training log showing training text, corresponding generated text from learned state, batch loss

Generating random text from learned state

```
#AtnBwiq nw#thn##aasi a r iaatiy aooornania#ytstytnrr ia#y iirsoytsi #nnr itsnry tt tay
y## ts t tysiony#yyiay# iatonrot t nniryto#oi#irtyao#rrr oyontyars t n ossaistr o o
nniinainso ysotyy#a r#yirtsarii#in r#tyaoniassysioiarsysry # ray yniretsttrysynnati
aaann#sotr#ytsi nyiranyta satyi i naiattnriaa iaannyato nnr# eriarsnasoy a # ni# ai#orni
isit#tiy snao#yairysrsa y#ya##artonaaris#a#aysiraa #yaaan #i#iyonsitoyyitiotsrssnai
aaatoon raytotryyyo or # oi#nry#rr tn nn tnr#a si i# iya yt i ror#y #ner nntnttiratio#n
rs# yaarntnyinrs #arriaiaysyrt #st nsrao ia#nr#tssyso yoir#trartono y#rn r#oia
rsyiointso#rityr r aynaanyosi risnyooiro###yniaatss sos to #rtna n arinarts or aons t issnoi#
tonno t#r aynor oria tsytynon noonoait ###nytst#tntnsayitnrnsors t ianiyn##nr
nrytyityio#s #irs ni#iaro# ta ao taa i osoay neoriniyn# artti ornsan iort t y
yrtaoanotysroyn #rt#ri##r#ystrisyrriasyaitstairrr sanon nonanyriorittra# ss# at
iayriiy#ys aa a#yasa# iyyin##iesr rat# nrys
```

End of generation

Table 2: Example of a generated text, early in the machine-learning process

coming into focus before the content. For example (see Table 3) in generated random text we see repetition of different variants of popular hashtags within the training text.

Training continued over a number of iterations using varying sizes of training data sets and different starting parameters to produce results that were at first glance indistinguishable from real tweets. Training logs were saved to be used in the exhibition of the work. Once trained the network is deployed to generate tweets with a Twitter-bot tweeting text from all stages of the training on a project Twitter account @RiseandGrind_ML (see Figure 2)

The final generated tweets had very successfully adopted the style and of their training tweets and

did not seem out of place on the hashtag. It was noted that certain tendencies in the training data had become more pronounced and insistent with a noted shift to the right. The outputs were seen to have not only repeated but amplified the bias obvious from the hashtags. This amplification of the bias appeared to have come from a process of smoothed out difference and subtlety and thus erasing some of the context; the idiosyncratic, the ironic, the linguistic plays, the subtle sub-tweets, and the nuanced weird of the internet were all lost in translation. Without this context and these modifiers, the patterns of the hashtags’ text which were replicated in a more or less convincing manner seemed like relentless exhortations to hustle and grind that contained none of the fun of the originals. (Figure 3)

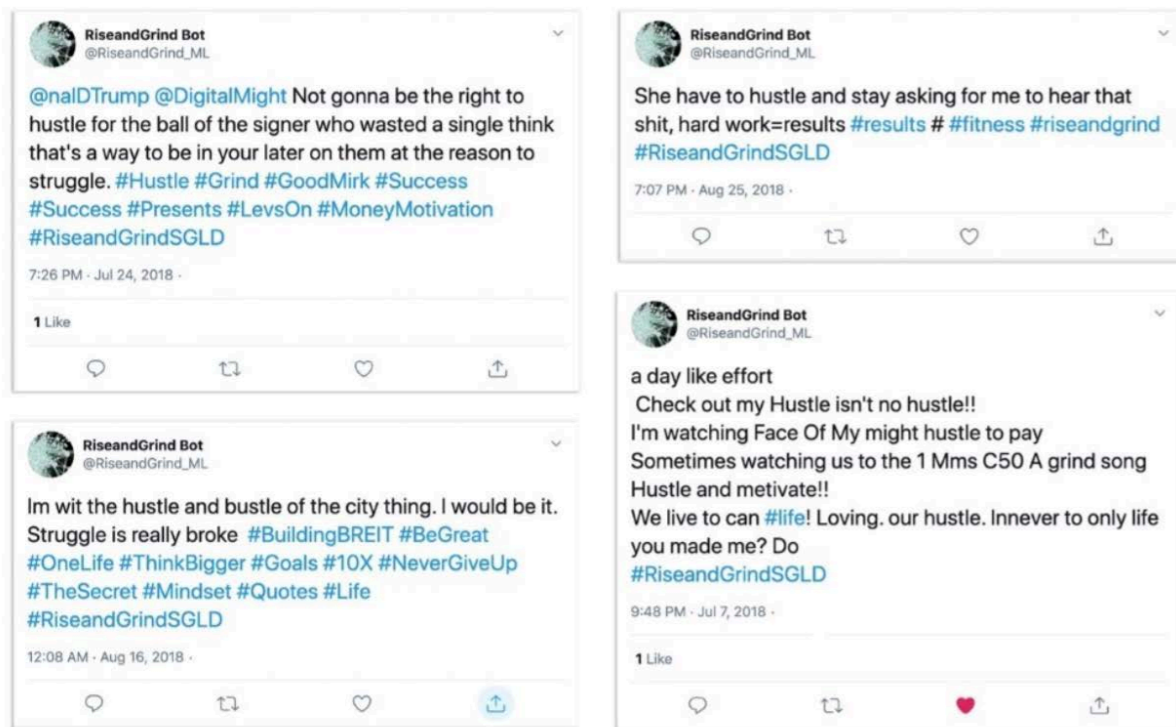


Figure 1. Early generated tweets achieve many aspects of Twitter style but don't make sense

TRAINING STATS: batch 104/173 in epoch 2, batch loss: 1.78837, batch accuracy: 0.51517

Generating random text from learned state

ealys! #riseandgrind #suncass #fitness\00
 #riseandgrind \00\00\00\00\00\00\00\00
 RT @TheSharkDayMond #MandayMotivation #RiseandGrind #MondayMotivation\00
 #riseandgrind #hustle #riseandgrind #goodmorning #motivation #motivation #motivation
 #motivation #motivation #motivational #makenturself #motication #morning #motivation
 #motivation #morningmotivateon\00
 RT @TaeseardDaymond #riseandgrind #goodmorning #riseandgrind
 @TheSharkDaymond #RiseAndGrind #RiseAndGrind #MandayMotivation\00
 #riseandgrind
 #riseandgrind #goals #goodmorning #riseandgrind
 @ around and getting. #riseandgrind #goodmorning #riseandgrind #goodmorning
 #motivation #motivation #morningmotivation #motivation #manday #motivationalgoods
 #bosings #morningmotivation #riseandgrind #sundaymotivation #morningmorning
 #riseandgrind
 @ and the wonth the work this morning! \00 #RiseAndGrind #RiseAndGrind
 #RiseAndGrind \00\00\00\00 #RiseAndGrind
 #RiseAndGrind
 RT @TheSharkDaymotivation: The samplow #riseandgrind #success
 #morningmotivation\00
 RT @MondayMotivation #Ri

End of generation

Table3: Random generated text from learned state demonstrating repetition of popular hashtags from the training data

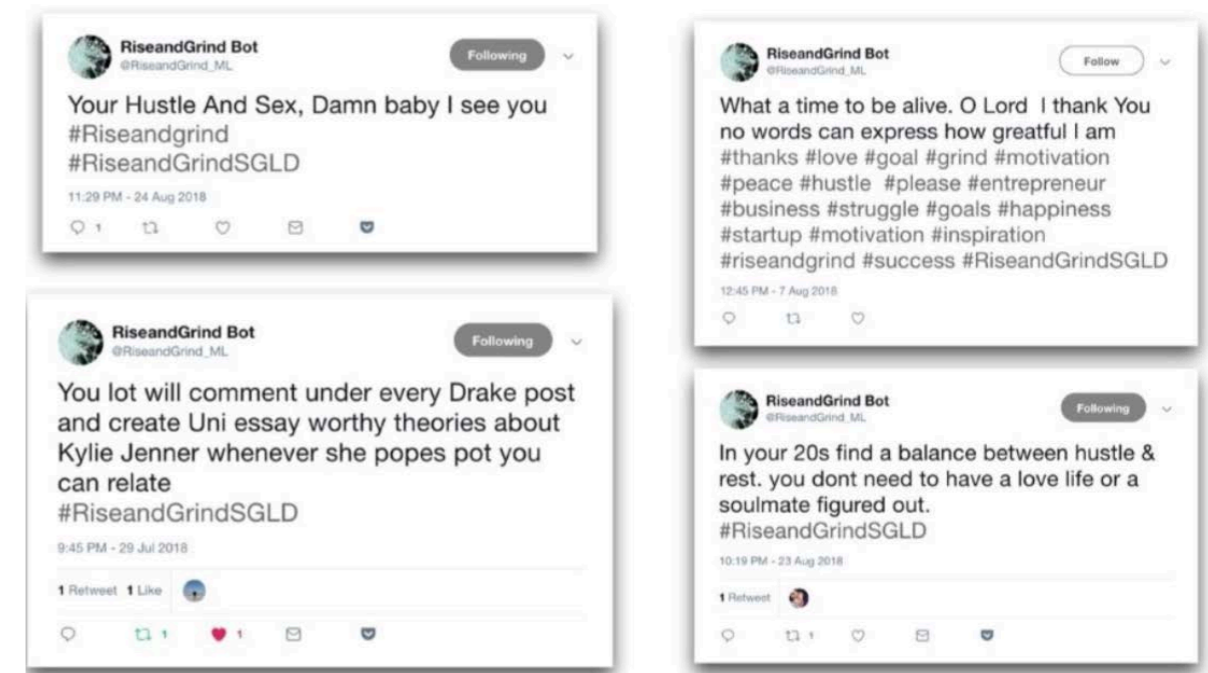


Figure 2: Sample tweets from the fully trained model

Exhibition

There were two main impetuses to this work: one was the hashtags themselves, in my artistic practice I have always been interested in informal internet communities particularly those that form around practices and concepts to construct an autonomous conceptual world view. Previous work such as *JoyceWalks* (McGarrigle 2009), *Spook...* (McGarrigle 2015), and *24h Social* (McGarrigle 2020) addressed these ideas of hybrid internet-based conceptual worlds from a number of perspectives. #RiseandGrind follows in this path through an engagement with a cohesive world view assembled under these two hashtags; one that speaks to the power of social media as a medium for assembling people and ideas in entertaining and powerful ways, and the power of the platform to algorithmically shape its content in way that are not readily apparent; the second was as a process of critical engagement with machine learning, to make visible not only how bias can be reinforced through machine

learning but also the operation of the black-boxed machine-learning process itself.

The work was installed in a number of different iterations from its original commission for *Hustle* at the Science Gallery Lab in Detroit. The work was further developed as part of a residency with Parity Studios at University College Dublin and Insight Centre for Data Analytics, with new components developed and added for exhibition in *TULCA* Exhibition of Visual Art in Galway, and in *Screentime* in the Green on Red Gallery Dublin.

The exhibition is centered on a neon text piece, *#RiseandGrind*, connected to a live Twitter feed, which illuminates and dims based on activity on the hashtag. Screens display the training process throughout the duration of the exhibition as scrolling text that displays the input training text, the network's sample texts and their probability weighting, epoch by epoch, from early stages to fully trained. The Twitter Bot is displayed on a series of 7" screens powered by network connected Raspberry Pi board computers alongside a live display of

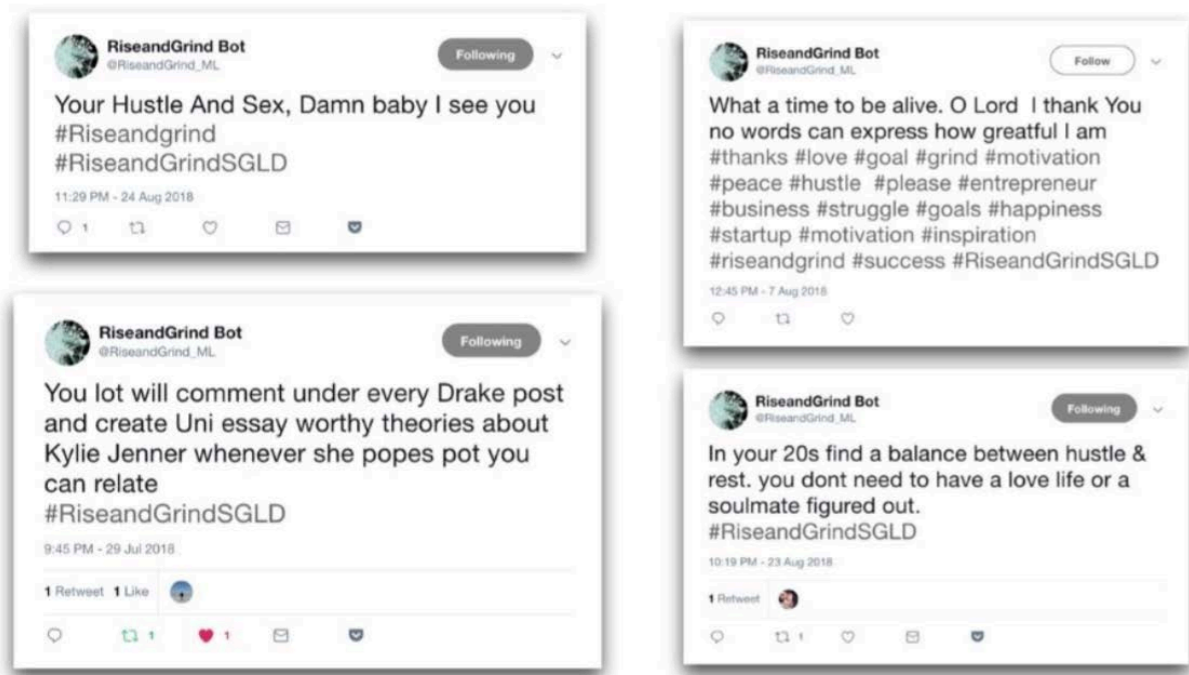


Figure 3: Generated tweets from late in the training

the hashtags from Twitter (see Figure 4). The final element is a screen-based display of all the generated tweets character by character (See Figure 5). The exact configurations of these elements are decided based on the gallery space. The exhibitions are accompanied by mediation and discursive events including the Science Gallery Lab Detroit's extensive programme of docent tours, artists talks for TULCA in Galway, and a panel discussion with academics and curators at Green on Red gallery with all events open to the public.

Conclusion

#RiseandGrind is a research-based artwork that, through a process of active engagement with the machine-learning tools of what is known as artificial intelligence, sought to make visible the complex relationship between the origins and context of training data and the results that are produced through the training process. It is a process work, and as such the final exhibition outcomes, while important, are not the sole arbiters of the work. Of equal

importance are the components of what was a sustained process of engagement with these Twitter hashtags, their rendering as data and processing to model the complex activity so that it could be emulated. This process is at one level an attempt to unpack, understand, and generate new knowledge about machine-learning and its connection with artificial intelligence conceptually and in practice. In this respect the active engagement with the process with its errors, missteps and lack of expertise are an essential component of the work.

The work originates in an interest in ad hoc internet communities that assemble around diverse interests that are conceptually linked through overarching values – in this case a belief that self-reliance and hard work are the key attributes for success – and how these can be dynamically formed within Twitter's hashtag bubbles. Arguably this ability to assemble and empower communities and audiences, real and imagined, across geographical divides is what has made the internet central to everyday life. The work demonstrates the tension between the

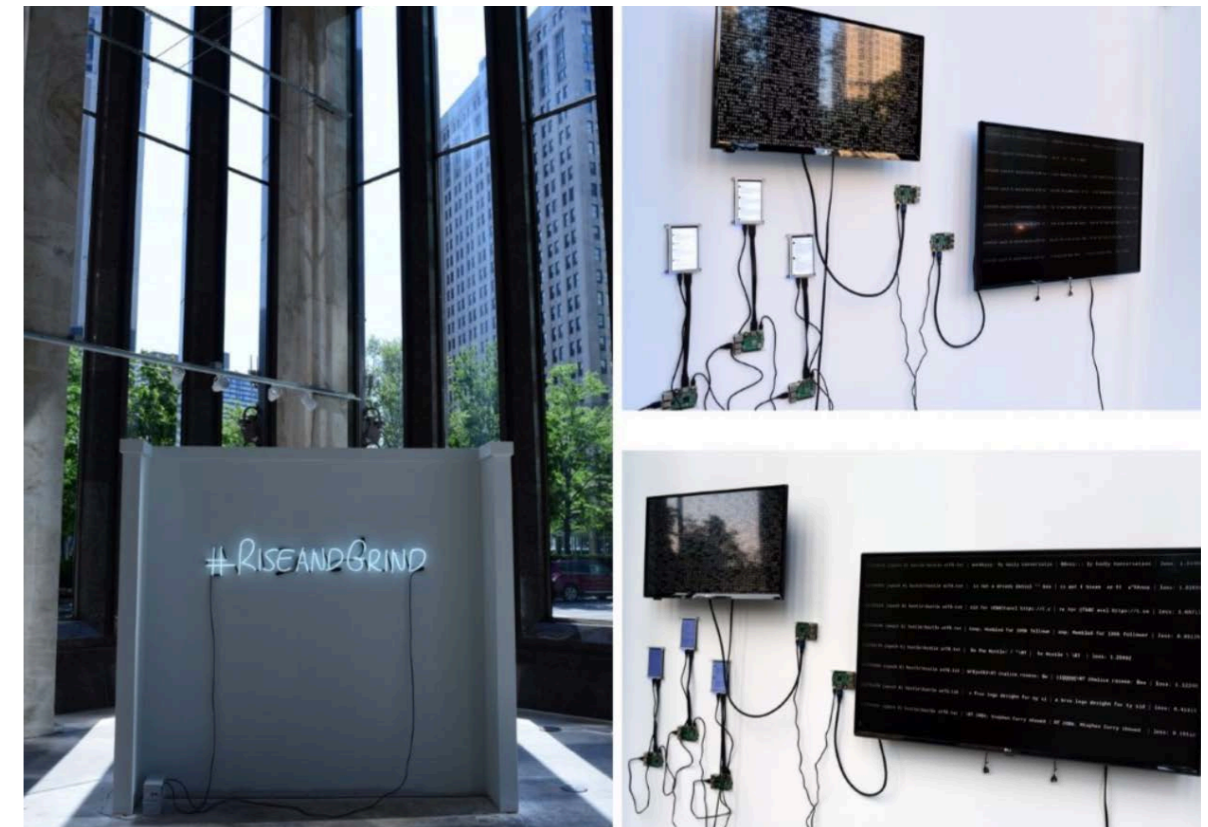


Figure 4: Installation view, Science Gallery Lab Detroit 2018.



Figure 5: Installation view with screen scrolling through all of the generated texts

internet as social and surveillance space, as is evident in the relative ease that the hashtags can be captured and used to model and replicate their activity as behavioural surplus. Although there is an expectation that tweets are in the public domain, the uses to which they are put are not widely known, the artwork visualises one such process, the training of machine learning models and their deployment to generate text. In this simple way the project seeks to make visible the opaque workings of machine learning and to highlight issues of bias and the role of the origin and context of training data in creating and sustained algorithmic discrimination. The world view returned by the trained model was a cohesive one that replicated the bias obvious from the hashtags themselves. However, it also amplified this bias through a process of smoothed out difference; the idiosyncratic, the ironic, the subtle sub-tweeting, and the nuanced weird of the internet were all lost in translation, replaced by a hard relentlessness to hustle and grind that contained none of the ambiguity and fun of the original. The patterns that were identified and extracted were not wrong, but the tone in which they were delivered was.

The process of the work itself produced many individual aesthetic moments that were unique to the process. These are reminiscent of glitch art where algorithmic and machine processes produce these in-between states that speak to the nature of the technical process, making visible the workings of normally opaque algorithms in a way that I suggest is unique to art, bringing an additional perspective that adds to the critical debate on AI and society.

While bias in machine learning has been widely recognised it remains a significant problem that calls for broad agreement on AI ethical practices in civil society that goes beyond an ICT industry perspective. Artists have engaged with AI at many levels from works that have sought to open the black box and ask critical questions such as *Anatomy of an AI* (Crawford and Joler 2018), *Not the Only One* (Dinkins

2017) and *Imagenet Roulette* (Paglen 2019) and work such as *Portrait of Edmond Belamy* (Obvious 2018) that promote AI as new tools of machine creativity. I propose that critical AI artworks, to which I believe *#RiseandGrind* contributes, can act as artistic research method that provides a critical lens to make visible the workings of black-boxed algorithmic systems and can suggest alternative paths, albeit at a minor scale alongside other methods. As AI's hype-cycle accelerates these contributions can make important contributions to this debate.

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