

The Cyborg Subject: Parallax Realities, Functions of Consciousness and the Void of Subjectivity

Item Type	Thesis or dissertation
Authors	Benjamin, Garfield
Download date	2026-05-20 16:57:29
Link to Item	http://hdl.handle.net/2436/621858

THE CYBORG SUBJECT

**PARALLAX REALITIES, FUNCTIONS OF
CONSCIOUSNESS AND THE VOID OF SUBJECTIVITY**

GARFIELD BENJAMIN BMUS MMUS

**A THESIS SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENTS OF THE UNIVERSITY OF
WOLVERHAMPTON
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY**

AUGUST 2014

This work or any part thereof has not previously been presented in any form to the University or to any other body whether for the purposes of assessment, publication or for any other purposes (unless otherwise indicated). Save for any express acknowledgements, references and/or bibliographies cited in the work, I confirm the intellectual content of the work is the result of my own efforts and of no other person.

The right of Garfield Benjamin to be identified as author of this work is asserted in accordance with ss.77 and 78 of the Copyright, Designs and Patents Act 1988. At this date copyright is owned by the author.

Signature

Date

ABSTRACT

This thesis contributes to the fields of digital technology, consciousness studies and cultural theory by reassessing the relation of the contemporary subject to physical and digital worlds. By moving beyond the materiality of these worlds, this investigation will position the subject as a cyborg: a series of relations within consciousness that defines the reality and psychological construction of the subject across and through physical and digital perspectives. The functions of consciousness are set out as Existence, Meaning, Virtual, and Real, and their shifting relations defined in terms of physical and digital modes of consciousness. Using Slavoj Žižek's conception of parallax, applied ontologically to digital technology, and introducing a new framework for analysing consciousness as a series of relations between functions, the void of subjectivity is defined as the gap between physical and digital worlds. Within this framework the work of Gilles Deleuze and the philosophy of quantum physics are employed to negotiate a disruption of conventional reality with the Virtuality of thought and matter respectively, towards the conception of the subject as an engaged spectator. These methodological tools are developed to analyse cultural phenomena that highlight and challenge our consciousness of the relation between physical and digital worlds. Online and gallery-based digital art interventions, avatar-mediated spaces, computer games and representations of digital technology and culture in literature are examined in order to assess specific relations between functions, drawing the discussion towards the antagonism between Virtuality and Reality within the construction of the cyborg subject. Through these analyses, a critical position is established through which the contemporary subject is able to achieve the rupture of a minimal distance towards its own parallax position to confront the void of subjectivity between Virtual and Real functions of consciousness and between physical and digital modes of cyborg reality.

TABLE OF CONTENTS

ABSTRACT	iii
TABLE OF CONTENTS	v
LIST OF IMAGES	ix
GLOSSARY OF TERMS AND ABBREVIATIONS	xi
ACKNOWLEDGEMENTS	xiii

INTRODUCTION **1**

Hypothesis/Research Questions	1
Context	4
Territories of digital theory	4
The cyborg reconsidered	5
Žižek, Deleuze, quantum physics	8
Methodology	10
Structure	12
Theoretical Framework and Terminology	17
Subject/Consciousness	17
Existence	18
Meaning	19
Real	20
Virtual	20
Physical	21
Digital	22
Parallax	23

1 THE OPEN SUBJECT: MEDIA(TION) BETWEEN WORLDS **25**

1.1 Remediations of thought	26
1.1.1 Realigning realities	27
1.2 Cyber-War Machines and Virtual Nomads	29
1.2.1 Tools to Weapons	29
1.2.2 Anti-social network	32
1.2.3 Self-Destruction	36
1.3 Parallax Thought in Parallel Worlds	37
1.3.1 Redefining the parameters	37

1.3.2 Alternate worlds and systems	40
1.3.3 Self-Augmentation	44
1.4 Maurice Benayoun: This is Not Technology	45
1.4.1 Not object, not immaterial	45
1.4.2 Not cut off from the world	49
1.4.3 Not finished	52
1.5 Self-mediation	55
1.6 Conclusion	56

2 THE EMPTY SUBJECT: VOID-IN-ITSELF IN ART **59**

2.1 Not decentred but desubstantialised	60
2.1.1 One or many gaps?	61
2.2 Bodies without Organs without Bodies	63
2.2.1 The surface of consciousness	63
2.2.2 Hyper-cartography	66
2.2.3 The flow of Virtual and Real	70
2.3 A-Particle Physics	72
2.3.1 Vacuum	72
2.3.2 Nothing in particular	75
2.3.3 The limits of thought	78
2.4 Pascal Dombis: Irrational Subjectivity	80
2.4.1 Geometric permutation	80
2.4.2 Lenticular distortion	84
2.4.3 Technological disruption	87
2.5 Inaccessibility	90
2.6 Conclusion	93

3 THE ABSENT SUBJECT: *OBJET A-VATAR* IN CYBERWORLDS **95**

3.1 Disembodiment	96
3.1.1 The stain in my gaze	97
3.2 Expressing Difference within the Subject	100
3.2.1 Thinking constructing the subject: Me, iSelf and eye	100
3.2.2 One and zero as two infinities	103
3.2.3 Theatre of superposition	105
3.3 Observing Fragmentation across Worlds	106
3.3.1 Participating in pieces	106
3.3.2 Wave/Particle duality	109
3.3.3 Consciousness of superposition	112
3.4 Second Life Art	113
3.4.1 Avatar as object	113

3.4.2 Avatar as expression	116
3.4.3 Avatar as interface	118
3.5 Big A-vatar	121
3.6 Conclusion	124

4 THE UNDEAD SUBJECT: VIRTUAL MONSTERS IN GAMES **125**

4.1 Monstrous undeath	126
4.1.1 Between two deaths	127
4.2 Becoming-Death	129
4.2.1 Becoming-animal/-monster	129
4.2.2 Sorcerer, outsider, undead	133
4.2.3 Undeath in non-games	136
4.3 Quantum Immortal	138
4.3.1 Quantum suicide	138
4.3.2 Observation and cyberspace	141
4.3.3 The subject beyond the game	144
4.4 Portal: GLaDOS	145
4.4.1 Computer as monster	145
4.4.2 Beyond physics: immortality awaits	148
4.4.3 (In)human monsters?	150
4.5 Are Monsters 'Real'?	152
4.6 Conclusion	153

5 THE IMPOSSIBLE SUBJECT: CYBORG FUTURES IN FICTION **155**

5.1 Homo hypersapiens	156
5.1.1 More than myself	157
5.2 Cultural Fictions, Fictional Cultures	158
5.2.1 Propositional protagonists in the cyberpunk canon	158
5.2.2 Cyber culture as minor Culture	161
5.2.3 Fiction and progress	164
5.3 Inconceivability and the present	165
5.3.1 The view from a black hole	165
5.3.2 Beyond physics	169
5.3.3 Either side of the technological singularity	171
5.4 Hannu Rajaniemi: Just Add Quantum	173
5.4.1 Fractal memory in the future	173
5.4.2 Causal consciousness in the present	176
5.4.3 Quantum games reversing the past	179
5.5 Infinite Regress?	182
5.6 Conclusion	184

CONCLUSION	187
Contribution to Knowledge	192
Further Research	194
BIBLIOGRAPHY	197
CULTURAL ARTEFACTS	212

LIST OF IMAGES

Fig.1	No Fun (2010) © Eva and Franco Mattes	33
Fig.2	Freedom (2010) © Eva and Franco Mattes	35
Fig.3	Google Street Ghosts (2012) © Paolo Cirio	40
Fig.4	the 120 days of *buntu (2011) (Creative Commons) Danja Vasiliev and Gordan Savičić [Attribution Unported license 3.0: http://creativecommons.org/licenses/by/3.0/]	42
Fig.5	Tunnel Under the Atlantic (1995) © Maurice Benayoun	47
Fig.6	Tunnels Around the World (2012) © Maurice Benayoun	48
Fig.7	Stolen Life (2006) © Maurice Benayoun	50
Fig.8	Emotion Forecast for Urban Screen (2011) © Maurice Benayoun	54
Fig.9	Wissengewachs (2007) © Christa Sommerer and Laurent Mignonneau	64
Fig.10	The Conversation (2009) © Ralf Baecker	65
Fig.11	The Living Web (2002) © Christa Sommerer, Laurent Mignonneau and Roberto Lopez-Gulliver	70
Fig.12	Mobile Feelings (2003) © Christa Sommerer and Laurent Mignonneau	71
Fig.13	Life Writer (2006) © Christa Sommerer and Laurent Mignonneau	73
Fig.14	Spin (2009) © Pascal Dombis	81
Fig.15	Antisana II (2000) © Pascal Dombis	83

Fig.16	Irrational Geometrics (2008) © Pascal Dombis	84
Fig.17	Crack (2012) © Pascal Dombis	89
Fig.18	Void Archipelago (2012) © Trisme Trs	90
Fig.19	Avatar DNA (2006) Angrybeth Shortbread [Image © Garfield Benjamin]	108
Fig.20	The Loneliness of Being (2008) Ian Pahute [Image © Garfield Benjamin]	110
Fig.21	Portraits (2006-7) © Eva and Franco Mattes	114
Fig.22	Imogen and the Pigeons (2013) Bryn Oh [Images © Garfield Benjamin]	120
Fig.23	The Path (2009) © Tale of Tales	131
Fig.24	The Path (2009) © Tale of Tales	132
Fig.25	The Graveyard (2008) © Tale of Tales	134
Fig.26	Limbo (2010) © Playdead	136
Fig.27	Braid (2008) © Jonathan Blow/Number None Inc.	142

All images copyright their respective owners, reproduced with kind permission.

GLOSSARY

TERMS AS USED IN THIS THESIS

Art game: Computer games that challenge the gaming medium aesthetically or conceptually, favouring the creation of new modes of experience over conventional game mechanics. See Chapter 4 *The Undead Subject: Virtual Monsters in Games*.

Consciousness: Thought as a process; the self-positing of the subject as thought; the gesture of the cogito; the surface assemblage of the subject. See *Introduction: Theoretical framework and terminology*.

Cyborg: The human subject between physical and digital worlds. Beyond the part-human/part-machine prosthetic conception, this is an expansion of consciousness itself. The resolution of the internal antagonisms of the cyborg can be considered a state of posthumanism. See *Introduction: The cyborg reconsidered*.

Engaged Spectator: The process of observation through which the subject and its world come into being, each marked by the other; in art, the necessary role of the viewer in the participatory or interactive gaze.

Functions of Consciousness: The four processes by which consciousness creates itself to form the subject, the alignment of which defines the construction of physical and digital worlds:

Existence: Being-function of consciousness; the gaze, denotation, the observed universe, appearance.

Meaning: Communication-function of consciousness; signification, the conditions of truth, information.

Real: Void-function of consciousness; objectification of the void, Lacanian *objet petit a*, drive, expression.

Virtual: Function-function of consciousness; cognition, desire, illusion, surface.

See *Introduction: Theoretical framework and terminology*.

Parallax: The relative displacement of objects by a change in perspective; the ontological change in objective reality created by an epistemological shift in subjective position. See *Introduction: Theoretical framework and terminology*.

Subject: The perspectival position from which consciousness is thought; the assemblage of consciousness around this parallax void. See *Introduction: Theoretical framework and terminology*.

Void: The absent, desubstantialised centre of the subject and its perspectival position of parallax. See Chapter 2 *The Empty Subject: Void-in-Itself in Art*.

ABBREVIATIONS

AR: Augmented Reality

BwO: Body without Organs. Also **OwB** (Organs without Bodies)

CMB: Cosmic Microwave Background

RPG: Role-Playing Game. Also **MMORPG** (Massively Multiplayer Online Role-Playing Game)

SF: Science Fiction (literature)

SL: Second Life

ACKNOWLEDGEMENTS

I would like to acknowledge the support of the Centre for Art, Design, Research and Experimentation, University of Wolverhampton, for funding my research with a doctoral studentship.

I would like to thank my supervisory team, Prof. Dew Harrison and Dr. Denise Doyle, for their support and advice on my research, writing and the general process of completing a PhD.

I would also like to thank all the theorists who have inspired and influenced my research, and the artists who have been discussed in the thesis and who have generously granted me permission to include images of their works.

Thanks go also to the many denizens of the metaverse who have recommended books or art works, posted urls to interesting or unusual websites and videos, shared their musings on a range of bizarre topics, and generally helped guide me through the vast labyrinth of information that threatens to overwhelm any researcher of digital media.

Finally, I would like to thank my wife Elizabeth for her patience, love, and cakes that have helped us both through the process of writing theses.

PUBLICATIONS

Some of the work presented in this thesis has been published in part and in altered form in the following articles:

Benjamin, Garfield (2012) 'How to Wake Up the Bit-Shoveller: towards a cyber-artist[arsonist]'s handbook' in *Sanat Dünyamız* **131**, 84-93.

Benjamin, Garfield (2014) 'Playing Dead: Learning-through-dying and undeath as mediation in computer games' in *Media Fields Journal* **8** Playgrounds.

Benjamin, Garfield (2014) 'Hyper-Bodies of the *objet a*-vatar: the assemblage of the digital self' in Sam Wiseman (ed.) *Assembling Identities* Newcastle: Cambridge Scholars.

Benjamin, Garfield (2014) 'Quantum Horror, Quantum Doom: Dangerous Consciousness in the work of Greg Egan and Charles Stross' in *English Academy Review* **31**(2), 170-184.

INTRODUCTION

HYPOTHESIS/RESEARCH QUESTIONS

There has not yet been a consistent philosophy of the digital. The present thesis responds to this problem by proposing the foundations of a philosophy of the digital that draws together the role of the technology itself (as a manifestation of the digital in general as a reality and mode of consciousness), its psychological constructs in relation to the individual, and its expression through art and culture. The formulation of this research is constructed through a series of hypotheses regarding the nature and state of the digital leading to the core research questions relating to this new conception of the contemporary cyborg subject.

Hypothesis: There is an irreducible gap between physical and digital worlds.

Hypothesis: This gap is internal to consciousness.

Question: What constitutes this gap within consciousness?

While digital technology has increasingly permeated the physical world, social reality and our everyday lives, there remains a tension between physical and digital realms, a separation built upon their designation as such. As a human construct the genesis of digital reality has obvious differences from the physical universe. However, this goes beyond the formation of language as layers of human signification atop a physical ground. Rather, the digital is founded upon an alternative logic, a different mode of consciousness, and cultural artefacts residing within digital space occupy an alternative mode of being in relation to consciousness. This thesis proposes that this fissure is internal to the manner in which 'physical' and 'digital' are conceived within the contemporary subject, as a cognitive and cultural construct. Furthermore, positioning the gap between worlds as a gap within the subject brings about a definition of the subject as a gap, a void within itself. Confronting the nature of this void of subjectivity around which consciousness operates will be a necessary step in a philosophy of the digital as it relates to consciousness.

There has not yet been a consistent philosophy of the digital in relation to consciousness.

The thesis attempts to form the basis for a unified philosophy of the digital through an interrogation of its relation to consciousness, outside the concerns of a materialist inclusion of

the digital as a part of the physical world. In order to overcome both the dualist separation of physical-digital realities and the reduction of the digital to an effect within physical reality, the thesis views materiality as appearance in the discussion of the construction of a cyborg subject as a causal consciousness between the two realms. Whilst materialist perspectives will be instructive for their critique of the reality that appears to the subject, this thesis is concerned with the functions of consciousness beneath and causing such appearance, to parallel the quantum physical forces of immateriality that underpin the appearance of physical material reality. This must also resist reducing the digital realm to an imaginary space, and discussions of fantasy are therefore similarly rooted in the structures of fantasy within consciousness that underpin the appearance of the imagination in the construction of physical and digital modes of consciousness. The appearance of the digital as a separate realm to and within consciousness necessitates its discussion as such in any theory of contemporary subjectivity.

Hypothesis: Consciousness constructs physical and digital worlds in an ontological parallax.

Hypothesis: The subject emerges in the functioning of consciousness as it creates physical and digital worlds.

Question: How does consciousness posit itself as a subject between physical and digital worlds?

Expanding upon Kojin Karatani's reading of two irreducible perspectives through one another (2003), Slavoj Žižek's notion of parallax (2009b) states that the shifting perspective of the subject creates ontological shifts in the objects it perceives. This thesis transfers this disruption of the apparent material world by active consciousness onto the irreducible difference between physical and digital realities and their relation to the subject. Both realities thus occur as part of a subjective reality, from a position within the gap between worlds. The positing of such a subject is entwined with the creation of worlds within consciousness, emerging simultaneously as a process or function. The differences between physical and digital modes of reality can be seen in the different modes and relations of this functioning of consciousness. To interrogate this process the thesis defines the functions that create the subject and its realities. Four terms are presented as functions of consciousness through which to analyse the construction of physical and digital worlds: Existence, Meaning, Real and Virtual. Within this framework the role of consciousness can be examined across physical and digital worlds while maintaining the antagonism of the difference between the two realms, in order to assess the subject as the gap between physical and digital realities.

There has not yet been a consistent philosophy of the cyborg subject. This thesis proposes a cyborg as the necessary subject of a philosophy of consciousness that takes into account the manifold connections and relations of the functioning of consciousness as it actively engages with physical and digital worlds.

Hypothesis: The subject creating physical and digital worlds is a cyborg.

Hypothesis: The cyborg subject is formed as a self-positing consciousness sustaining physical/digital reality.

Question: How can the cyborg subject critically and creatively confront the functioning of its own consciousness?

The subject between physical and digital realities, emerging as the self-positing of both worlds within consciousness, is a cyborg subject. A philosophy of the relation of physical and digital worlds to consciousness is necessarily a philosophy of the self-regulating system of thought that constructs the subject across realities, whereby a cybernetic analysis consists of “the science and art of the understanding of understanding” (Donaldson 1992). That is, such a philosophy must take into account the creation of subjective reality by the subject, and interrogate the role and position of such a subject between physical and digital worlds.

To respond to these questions, Žižek’s parallax psychoanalysis is read alongside the theory of Gilles Deleuze and the philosophy of quantum physics to interrogate the internal relations of consciousness and its role in constructing the physical and digital realities of the cyborg subject. Subsidiary questions guide this discussion by extrapolating the functions of consciousness to interrogate methods of creating a space for critical interventions by the cyborg subject on itself: How do physical and digital worlds differ in their relation to consciousness? How does consciousness form a subject from the void of parallax between worlds? What is Real to such a cyborg subject between worlds? What is the relation of the Real to the Virtual within the consciousness of the cyborg subject? How might we reconceive the cyborg subject between the Virtual and the Real? This thesis thereby formulates and interrogates a philosophy of the digital in relation to consciousness as it forms from the void of a cyborg subject, using the functioning of consciousness as a key to analysing the construction of both physical and digital worlds within the ontological parallax of subjective reality.

The contribution to knowledge offered within the scope of this thesis will thus be fourfold: a theorisation of the parallax between physical and digital at an ontological level; a new methodological approach fusing Žižek, Deleuze and quantum physics as parallel systems of thought applied directly to the digital; a study of creative digital technologies in relation to consciousness through the original framework of the functions of consciousness – Existence, Meaning, Virtual, Real – and their internal formation and relation; a problematisation of subjectivity within digital technology and its culture, against the dominance of materialism in current literature.

TERRITORIES OF DIGITAL THEORY

Current research on digital technology focuses on the effects of technology, usually on a singular area of society and theory. From the optimistic technologists and artists of the 1990s to the more recent socio-cultural applications of digital theory, there is a disparate canon of the digital that is often entrenched in earlier debates from pre-existing fields. It was earlier technologists such as Michael Heim (1993) and Nicholas Negroponte (1996) who made the most radical steps towards a philosophy of the digital *in-itself*, yet they remained speculative, superficial and sanguine in their analyses, focusing on the changes within the technologies themselves as a material shift rather than the socio-cultural evolution of consciousness over time. More elaborate and influential theories are often based in issues of conventional media, particularly cinema and photography, such as the collection by Damian Sutton, Susan Brind, and Ray McKenzie (2007) which limits the analysis of the digital to its effects on these prior media fields, unconcerned with a philosophy of the digital as such. Approaching the digital as a mere extension of pre-existing media creates an instant barrier towards new modes of interactivity. Now an outdated term – having passed through its obverse of interpassivity and into notions of immersive art and alternative, freer modes of engagement – it is the inclusion of interactivity in conventional media that motivates many ‘new media theories’ (see, for example, Manovich 2001). The sustaining of antagonism between different perspectives has been developed by Roy Ascott as the necessarily syncretic nature of an interdisciplinary cybernetic theory, whereby “in emphatic distinction to binary opposition, syncretism is a process between different elements, the in-between condition of ‘being both’” (2005). This state is developed here ontologically in the construction of the cyborg subject as the parallax relation of consciousness between physical and digital realities.

The inherent role of consciousness in engagement remains to be fully theorised. Much work on the digital only “implicitly argues...that what is key to the phenomenon of New Media is our relation to it” (Creeber and Martin 2009, 4), rather than drawing it into full view as the focus of the debate. The definition of ‘new media’ emerged as an attempt to reconcile the effects of digital culture predating digital technology (Siapera 2012, 3-6). While emphasising the blurred lines of our relation to the digital, such a stance fails to engage fully with the effect of the digital on consciousness. The relation of the digital to consciousness necessarily

predates the proliferation or even existence of digital technology, as the shift has not been a single instantaneous event in which society transitioned from physical in one moment to digital in the next, but a process within consciousness that has allowed the digital as such to manifest. The term 'new media' has been perhaps most prominently emphasised by Lev Manovich (2001), whose background in film governs the framework of his discussion and definition of the term, replacing a concern with the digital as a new space for consciousness with the more clear and limited effects of digital technology on established film media theory. Martin Lister et al. (2003, 11) point out the ideological connotations of the term in relation to progress, which suggests that 'new media' is related directly to the technology as causal with secondary cultural relations, rather than exploring the causality of consciousness in the intertwined relations of the digital with contemporary subjectivity. Even writers such as Crispin Thurlow and Kristine Mroczek (2011), who acknowledge the importance of the digital in contemporary discourses, present a single theoretical application of media (sociolinguistics) rather than a confrontation with the digital in itself or in direct relation to consciousness.

The problematic relation of consciousness to the world is not only of relevance in digital technology. Aside from the long history of the philosophy of mind that has dominated Western thought since Descartes, at the beginning of the twentieth century science had already unearthed the seeds of tension between the appearance of the material world and the role of consciousness in the causal processes that underpin it. Quantum physics, with its focus on wave/particle duality, disrupts classical notions of our relation to the physical world, moving beyond the subject-object separation towards the causal function of consciousness in collapsing the wave function and creating the appearance of matter. This notion remains pertinent and divisive within science, and while digital and cultural theory often use quantum physical concepts as illustrative of hidden processes, such as by Gregory Sholette (2011) where after a brief and vague allegorical framing the discussion rests firmly under the terms of the politics of art, there is a gap within theories of the digital across which the active role of consciousness seldom penetrates. This resistance to the fluidity of a causal consciousness in the construction of worlds is seen in the increasing emphasis on a materialism of the digital, entrenching the formerly immaterial realm into notions of embodiment and inert mass.

THE CYBORG RECONSIDERED

Here is where the term 'cyborg' must be redefined, against its use by Donna Haraway (1985). While her work, and socialist feminism in general, made an important shifting away from the solidity of essentialist identities towards a fluid and engaged cyborg, the framing of the

discussion under explicitly micro-political and bodily identity terms (see its inclusion in Haraway 1991) places a boundary of social power relations upon cyborg *consciousness*. This enforces the materialist conception of embodiment that impedes a full assessment of the subject as the relations of consciousness to physical and digital worlds by relating cyborgs only as a resistant political Other against dominant ideologies rather than as Other to itself in the void of subjectivity. It is for this reason, in the context of poststructural feminism and the problem of persisting micropolitical identities, that gender, race and disability will not be dealt with in the discussion of the formation of a cyborg *as such* rather than the narrow view of specific identified manifestations. Don Ihde acknowledges the fact that “in the light of the rapid changes in technologies, there must be reciprocal changes in the philosophies that respond to, reflect upon, and deal with technologies” (2012, 331), but undertakes this project in a similarly narrow conception of cybernetics as prosthesis, ignoring the need for a reciprocal change in philosophy across physical and digital realities and new modes of conceiving consciousness. He states that “what today is popularly called cyberspace is the technological capacity to bring the remote near.” (*Ibid.*, 326), following a phenomenological approach that echoes what he hails in Haraway’s “biology-centred work” (*Ibid.*, 331). Outside the lost fetish of physicality in prosthetic conceptions of the cyborg, cyberspace emerges as a creative alternative space with which consciousness can engage, not merely a tool for communicating across vast distances or simulating a lost physical reality. This difficulty in relinquishing conventional notions of embodiment even in their explicit critique can also be seen in the digital arts, for example the contributions in Mary Anne Moser’s collection (1996) that enforce the role of the physical body as a limiting factor on the experience of consciousness, or the work of Susan Kozel (2007) whose practice as a performance artist focuses her entire theoretical framework around her own body and its relation to external worlds. While these works and others take important steps towards problematising embodiment, the focus on the materiality of the digital further obscures its relation to consciousness.

Katherine Hayles aligns the cyborg with a posthuman stage of evolution, stating that “the defining characteristics involve the construction of subjectivity, not the presence of nonbiological components” (1999, 4). While this establishes the subject as the centre of discussion, it reduces cybernetics to the prosthetics of physical loss rather than the augmentation of consciousness, and becomes mired in an obsession with reinserting embodiment against the posthuman view of “the body as the original prostheses” (*Ibid.*, 3). While Hayles later recognised the need to move beyond her earlier “versions of the posthuman that would acknowledge the importance of embodiment” (2005, 2) towards an array of potential posthumans, she shifts the discussion once more into a form of

embodiment through a materiality of information in digital technologies rather than into the consciousness of parallax that defines our manner of overcoming the relation between the physical-digital antagonism within the subject itself. This emphasis on materiality arises in part from a misconception of Virtuality as “the cultural perception that material objects are interpenetrated by information” (Hayles 1999, 13). In this thesis the Virtual is the process by which consciousness creates the subject, with the simultaneous appearance of materiality and its structures of signification. It is not until recently that Hayles has emphasised the need to acknowledge the shift in perspective of subjects thinking with digital technology, and the view that “materiality, like the object itself, is not a pre-given entity but rather a dynamic process that changes as the focus of attention shifts” (2012, 14), albeit within the narrow context of comparative media studies and the impact of technology on scholarly activity. Here still, however, the limitations of embodiment linger with discussions of informational “node bodies” (*Ibid.*, 15) and the “embodiment of material artifacts” (Hayles 2010, 328).

Mark Hansen appears to make some progress in establishing the emerging need to discuss not separate physical and digital spaces but “a fluid interpretation of realms...a mixed reality stage”, yet limits himself to “the central role played by the body in the interface to the virtual” (2006, 2). This is based on the same error as Hayles and Ihde in defining the Virtual as a filling of (physical) space with information rather than as the functioning process of consciousness (or/as computation) between spaces. Hansen does, however, emphasise mixed reality for “its eschewal of representationalism and embrace of a functionalist perspective” (*Ibid.*, 3), yet returns to the familiar paradigm which “foregrounds the constitutive or ontological role of the body in giving birth to the world” (*Ibid.*, 5) in a return to pre-technological (pre-reproduction) conceptions of “the aura that belongs indelibly to *this* singular actualization of data in embodied experience” (Hansen 2004, 3). While Hansen views embodiment as inseparable from cognitive neural processes, this too reduces the entire consciousness of the subject to a materiality of the physical body. We must move towards a functional approach to consciousness *in itself* if these theories of re-embodiment are to be re-dis-embodied. Only by stepping outside of any situated bodily space can the parallax perspective of the void of subjectivity emerge for critical confrontation.

Anna Munster (2006) also makes a purposeful effort to reinsert the body and affect into the digital, placing the Virtual as a part of materiality rather than a force in relation to consciousness. This work, with its focus on “the point of intersection that digital flows have with issues of embodiment” (*Ibid.*, 24), remains entrenched within materiality. There is a clear Deleuzian influence in Munster’s work, and both Deleuze and Félix Guattari are referenced heavily in relation to the Virtual, as well as notions of flow, diagram and time. Indeed it is the

work of Deleuze that is placed in this thesis alongside the philosophy of quantum physics within the framework of Žižek's parallax to interrogate the cyborg subject in relation to the gap between physical and digital worlds under the terms of a series of functions of consciousness. This is in part an attempt to confront a common thread throughout the history of digital theory: a failure to fully address the role of the subject amidst the increasing digitisation of the world. However, such works remain instructive for introducing the relevant questions and problems within scholarly discussion of the digital. For example, Sherry Turkle highlights the contemporary "disjuncture between theory (the unitary self is an illusion) and lived experience (the unitary self is the most basic reality)" (1997, 15) that draws notions of digital consciousness into the dilemma of modern physics, and Jean Baudrillard challenges that "the hypothesis of objective reality exerts such a hold on our mind only because it is by far the easiest solution" (2005, 47). This thesis places itself within the negotiations of digital technology that have established antagonisms within the relations of embodiment and objective reality and against the materialist insistence on the physical that dominates current scholarship, using cultural theory to analyse the expressions and impact of the digital and consciousness studies to confront the relation of the digital to the contemporary subject. This necessitates a return to earlier conceptions of cybernetics as an interdisciplinary pursuit for the expansion of human intellect (Ashby 1957; Licklider 1960; Engelbart 1962), a study of our cognitive behaviour and its relation to conceptual and technological processes. To this end, the thesis draws on theory from both within and without the fragmentary field of digital culture to assess the psychological, metaphysical and quantum functions of the cyborg subject as the gap between physical and digital realms.

ŽIŽEK, DELEUZE, QUANTUM PHYSICS

Within theories of digital technology and its culture two strands of a radical reassessment of the very terms of the discussion have emerged, centred around the problematic notion of 'Virtual Reality' that has dominated cultural depictions of the digital world. Digital technology has called into question the appearance of 'reality', forcing even the most rigid materialism to have to take into account the possibility of other spaces with which the human subject can engage. How the individual relates to such other potential realities can be understood in redefining the term 'Real' along Lacanian lines, particularly as applied to cultural phenomena by Žižek. Writers such as David Gunkel (2010) have furthered this notion, drawing out the Real across physical and digital worlds as the hidden causality (for example, quantum wave functions, DNA or bits of computer code) that underpins the appearance of objective reality. This Real is inaccessible and terrifying, the traumatic abyss at the centre of contemporary

subjectivity (Žižek 2009b, 210). Counter to this development is the expansion of the term Virtual, often taking into account the definition developed by Deleuze as a surface that is not actual but with which the subject can engage. This has been applied as an alternative to the conflation of 'virtual' as 'digital' implied in the labels 'virtual reality' or 'virtual worlds', to instead connect the fluidity of digital surfaces to consciousness in a relation consistent with other generative effects within the structures that form the idealist element in Deleuzian philosophy. Between these two expanded terms, however, there is little crossover in current literature. Nicholas Gane and David Beer (2008), for example, draw heavily on the work of Deleuze for notions of virtuality and the concept, while mentioning Jacques Lacan only briefly as an extension to Freudian memory. Throughout the field, the antagonism between Virtuality and Reality persists as a theoretical pariah in the parallax of physical and digital. Žižek's own discussion defines Deleuze's Virtual as Lacan's Real which, while acknowledging the importance of the reality of the virtual over 'virtual reality' (Žižek 2012, 3), conflates the nuances of the two processes within consciousness and their functions in the generation of the cyborg subject. The antagonistic relation between the Real and the Virtual, in the expanded sense of both terms, forms an integral method of analysis throughout this thesis, and the productive conflict between Žižek and Deleuze assists in developing a theory of the digital founded upon the antagonistic relation between the Virtuality and Reality of the cyborg subject.

Further consideration of the use of these two thinkers, alongside the philosophy of quantum physics, is required regarding their affiliation with the digital. Quantum physics, as a hard and abstract science, has at first glance little concern with digital culture. While the search for empirical proof of the particularities of fundamental particles may seem far removed from any cultural implications, the relation of immaterial processes to consciousness provides an illuminating cross-analysis between quantum and digital modes of thinking, and the cosmological impact of these forces in the formation and ultimate fate of the universe are instructive in the emergence and potential futures of our own consciousness and cybernetic multi-verse. Furthermore, the scope for an application of quantum physics to a philosophy of the digital reinforces the active role of consciousness in constructing a physical or digital reality. This can be seen in several examples: Hugh Everett's many worlds theory (in DeWitt and Graham 1973) which confronts the superposition of actually occurring parallel universes defined only by which probability a consciousness perceives; David Bohm's discussion of thought (1994) manifesting as an emergent system across quantum and cognitive disciplines; and John Wheeler's it-from-bit theory (in Zurek 1990) in which fundamental physical processes precisely are binary digital operations decided by consciousness.

Similarly, Deleuze does not directly discuss digital technology in itself, however his work with Guattari establishes methods of analysis that can be applied to digital culture, and his notion of the Virtual has, as already discussed, formed an integral mode of reconceiving the immaterial flows of digital space. Žižek, on the other hand, often mentions digital culture in his cultural psychoanalysis. However, while his analysis of digital technologies is instructive, pointing out that “how cyberspace will affect us is not directly inscribed into its technological properties; rather it hinges on the network of socio-symbolic relations which always-already overdetermine the way cyberspace affects us” (Žižek in Wright and Wright 1999, 123), the digital remains within his work only ever either illustrative of a theory concerning ‘real’ physical life or symptomatic of broader socio-economic issues. While Lacan directly discussed psychoanalysis alongside cybernetics in the construction of signification (1988, 295f) – a view of machinic processes of thought in “the process of complete transformation” (*Ibid.*, 31) expanding cybernetics to consider presence and absence within consciousness (*Ibid.*, 300) – Žižek rejects any overtly positive connection with cybernetics and digital technology. Indeed, Žižek’s ultimate use for the digital realm is to destroy it in a “virtual catastrophe” that will “somehow redeem ‘real life’” (Žižek 2008a, 213). This thesis therefore re-applies Žižek’s theory in the framework of an explicitly digital study, utilising his psychoanalytical construction of the subject as a void and his cultural analysis of contemporary media and art while stripping them of the nostalgic preference for the physical world. Žižek is an overt materialist and, despite his insistence on materialism as being concerned with the *non-existence* of matter (2009b, 17-8), his view on the dominance of the causality of physical matter reveals the need to extend his work if a deeper understanding of the digital in itself is to be sought. Similarly, his references to quantum physics (see, for example Žižek 2007, 189f) remain allegorical and noncommittal, using the immateriality of quantum processes to describe psychological processes that remain essentially disconnected from what he describes. This thesis reassesses these notions less allegorically, connecting the physical and digital realms in their relation to the construction of a genuinely cyborg subject.

METHODOLOGY

Within this discussion of consciousness, technology and culture, the various strands of inquiry remain focused on the core research questions set out above, namely the relation of the functions of consciousness to physical and digital worlds in forming the cyborg subject as the void of an ontological parallax perspective. The thesis does not present a finished and

complete philosophy of the digital, for such a task is beyond the current inquiry, but rather outlines a new formulation of the contemporary subject that ultimately reconciles the expanded notions of both the Real and the Virtual within consciousness, establishing a method for examining our relations to theories and cultures of the digital. This is built upon an original framework of terms under which the functions of consciousness can be assessed across physical and digital modes of subjectivity: Existence, Meaning, Real, Virtual. The focus of the discussion is the individual subject rather than overtly social elements of digital technology, except in direct relation to consciousness, for example the extension of Meaning as communication or the abstract notion of Otherness expressed by Lacan (1977) as inherent *within* consciousness. Social reality is referred to as a presupposed externalisation of the functions of consciousness and its relation to other potential subjects. However, this is not the focus of the discussion but rather a way of approaching external cultural artefacts.

The cultural artefacts that are used for an analysis of the construction and critical disturbance of physical and digital worlds centre on artistic interventions. While mass media is considered, as part of the general state of physical and digital worlds, it is those works that engage in a disruption of accepted media that allows for a space of critical distance to the smooth functioning of consciousness to be opened within the discussion, and thus enable an understanding and critique of the cyborg subject. Film, television and photography are therefore not directly confronted in the manner of other media, though they are drawn into the debate where they might inform a specific salient point concerning the nature of consciousness. Performance is also not directly assessed due to the focus in scholarship in this field, as well as in film and photography, on the effects of digital technology in changing a pre-established medium. The aim of this thesis is to confront an analytical theory of the digital in itself rather than as a historicised moment within general media theory. Within the remit of specifically digital concerns, a defined set of cultural artefacts are analysed in relevance to each issue and as part of the overall argument of the thesis: the inversion of Existence and Meaning that creates the physical-digital gap, the simultaneous emergence of Real and Virtual from the void in the creation of the subject, the Real of the physical and its necessary link to a given world's Virtuality, the structure of fantasy supporting the relation between Virtual and Real, building towards the resolved and sustained antagonism of Virtual and Real. The order of the chapters, including the focus on different creative practices utilising digital technologies, builds alongside the argument of the thesis, developing the theoretical point from the technology itself, moving inwards to the detailed construction of the subject and then outwards to the future resolution of the problematic relation of the cyborg subject to itself and its position within both contemporary society and a cybernetic society yet to come.

Digital fine art and online interventions are assessed in order to establish the construction of our perception of the digital world and offer an engaged form of spectatorship that draws the subject into both worlds as a creative force, both aesthetically in applied examples and ontologically within the theoretical framework of consciousness being hypothesised. Avatar-mediated spaces and artistic practice are utilised in provoking an anti-materialist perspective on parallax as it relates to the digital, and the computer game paradigm of mass media is assessed through the practice of 'art games' that challenge the accepted conceptions of our engagement with the digital realm. Finally, to define art in its broadest sense, and in the extrapolation of cultural products in relation to ideas within consciousness, literary examples are used to suggest alternative methods of conceiving our relation to technology along with a series of extrapolations of potential problems and a series of cultural markers that have defined and expressed such relations and dilemmas throughout the development of digital technology. This use of speculation closes the discussion as the future of the cyborg is considered through literary stagings and the development of technological culture. Here film is of relevance, in combining alternative narratives with a visual expression, although it is precisely the non-visual nature of literature that enables an extension of abstract notions within consciousness. Throughout the analysis of these cultural artefacts, as expressions of the subjective relation to digital technology, the thesis focuses on establishing a mode of rethinking the contemporary subject as a cyborg: a consciousness around the void of a parallax perspective between physical and digital worlds.

STRUCTURE

The process through which this thesis contributes to scholarship concerning digital consciousness and its culture, and answers the research questions raised above, entails an analytical structure applied across each of the five chapters. Within the chapters, each a different position in relation to the functions of consciousness and a particular view on the cyborg subject, a common framework is applied. Firstly, the central question of the chapter is postulated in Žižekian terms, within the structures of parallax and the psychoanalytical construction of the subject, followed by Deleuzian and quantum physical analyses of a specific application of digital technology. These two separate approaches, focused around a particular text by Deleuze and interpretation of quantum theory, are drawn together in an in-depth analysis of a particular technology or artist's work that exemplifies a critical position on digital technology and an informative expression of the particular nature of the subject in question. This flows back into an analysis in Žižekian-Lacanian terms and a confrontation with the core research aims of the thesis. Each chapter of the thesis confronts a specific interrogation of one

facet of this inquiry into the parallax of the digital, the functions of consciousness and the void of subjectivity. These questions are formulated around a specific relation between functions, or the relation of a specific function to the construction of the subject. Thus each chapter forms a different view of the cyborg subject and undertake a critique of digital consciousness from a different perspective, drawn together in the ongoing discussion of Virtuality and Reality in the formation and critique of digital parallax and cyborg consciousness.

The first chapter, *The Open Subject*, outlines the fundamental difference of the physical and digital modes of reality within consciousness, formed through the inversion of Existence and Meaning. The internality of this gesture extrapolates the mediation of consciousness by itself, across both realities. This sets the tone for the other chapters by constructing the relation of the subject to the two realms. Focusing on online media and the critical potential of interventions within the abstract, global, purely digital space of the internet, a number of examples are elucidated that demonstrate the inversion creating new worlds, the obstacles of moving freely between the two worlds, steps being taken to open up new spaces for subjectivity within the coded digital space, and the conflicted position of the subject between digital spaces and their links to physical locations. Žižek's problematic notion of matter is assessed in the context of digital information, before a discussion of Deleuze and Guattari's conception of machines, particularly the war machine as part of their 'nomadology' (2004b, 387f). This constant displacement of the subject across space as a destructive and critical force is placed alongside the shifting parameters of space itself in quantum physics. Using Bohm's interpretation (2002) and Everett's many worlds theory (in DeWitt and Graham 1973), the role of the subject is positioned amidst the conflicting dominance of Existence and Meaning across physical and digital worlds respectively, while suggesting the need for an interaction across multiple systems of reality. The conceptual work of Maurice Benayoun is used as a study of these ideas, with his critical use of technology in cutting across physical spaces through digital mediation and the subsequent construction of new immaterial spaces of informatic subjectivity. This analysis closes by reasserting Žižek's parallax as a method of achieving a critical distance to the self-mediation of the subject, raising questions concerning the possibility and nature of a radical intervention within consciousness.

In the second chapter, *The Empty Subject*, the inquiry withdraws from the specifics of physical and digital worlds to interrogate the emergence of the subject. The formation of consciousness as a functioning Virtuality from the inaccessible Real of the human mind informs the nature of this inaccessibility. Žižek's definition of the perspectival position of parallax is suggested as a desubstantialisation of the contemporary subject. Rather than the decentring of the subject that has become commonplace in critical theory and

poststructuralism, the core of the subject is revealed as the void: the centred emptiness of consciousness. Jacques Rancière's conception of the unrepresentable (2007) is used to extrapolate this notion in the Real function of consciousness as the objectification of this void within thought. The Deleuzian body without organs (Deleuze and Guattari 2004a, 9f; 2004b, 165f) is then used to interrogate the subject as a surface of Virtuality around this void core, with Deleuze and Guattari's process of mapping (2004b 13; 181) applied to digital forms of diagrammatic art practice engaging with insubstantial spaces and informational structures, to reveal in the process by which consciousness emerges an indication of the counter-process by which the void is lost to thought. Conceptions of empty space in quantum physics illuminate the causal role of this void to consciousness, through an assessment of the quantum vacuum, dark spots in the CMB (Cosmic Microwave Background) and various forms of unperceivable particles, towards Wheeler's 'it from bit' hypothesis that invokes the binary processes of the digital world as the fundamental causal operations of quantum physical reality (Wheeler in Zurek 1990, 309-336; Wheeler 1998), expressed through technological art as the primary and participatory act of engaged spectatorship. The computer-generated gallery art of Pascal Dombis, fusing algorithmic creation with lenticular distortion, is analysed in detail for directly approaching the problems of contemporary subjectivity that are at stake in this thesis. The causal gesture in his practice, drawing informational chaos into visual art, is expanded through post-digital works towards a confrontation with the cracks in both the digital symbolic world and the subject itself. This initiates a return to the digital application of Žižek's parallax and the primary gesture of thought rendering itself inaccessible: the objectification of the void as the Real of consciousness and subsequent loss of self central to contemporary subjectivity.

Expanding this negotiation of loss at the core of the cyborg subject, the third chapter, *The Absent Subject*, confronts the conflicting relations of the Real between physical and digital worlds. The loss of material certainty brought into the everyday life of the contemporary subject in its permeation by the symbolic spaces of digital technologies is framed as a discussion of the physical Real: the loss of physicality that brings about many of the tensions between physical and digital. Žižek's challenge to Maurice Merleau-Ponty's embodied phenomenology (2009b, 227) provides a starting point for an interrogation of embodiment in general and the physical body as a lost object. Avatar-mediated spaces provide the cultural artefacts for analysis, using Deleuze's interlinked concepts of difference and repetition (2004a), to unearth the processes at work in a consciousness that can occupy, interact through and move between physical and digital bodies in material and symbolic spaces. The quantum physical role of observation extends this disembodiment into the fragmentation of external physical reality, leading through the wave/particle duality and Werner Heisenberg's

uncertainty principle (1949; 2000) towards a hypertextual role of embodiment as a mode of participation for the subject as an engaged spectator of physical and digital worlds. The avatar-mediated environment of Second Life, by Linden Labs, provides a specific example in developing the digital body of the avatar as an object, as the lost object cause of desire in Lacan's *objet petit a* (1977, 67f; 263-274), as an expression, of difference from and within the subject, and as an interface, in a hypertextual definition of embodiment as cognitive engagement. This returns to Žižek's extension of Lacanian concepts in undermining the hold the physical body has retained over perception and cognition in recent research, revealing the symbolic control that embodiment enforces upon the subject through both physical and digital body. From the lost object of the Real within the bodily shell the subject presumes to inhabit, to the Virtuality of big Other in the illusion of materiality such embodiment creates, the need for a distance towards the body is asserted, to allow for the desubstantialised parallax position of the cyborg subject to emerge.

This structure through which the Virtual desire maintains dominance over the lost Real of the subjective position is confronted in the fourth chapter, *The Undead Subject*. Taking the Real to what Žižek describes as its traumatic, horrifying and monstrous conclusions, its relation to the Virtual functioning of consciousness is interrogated through the medium of computer games. Built around a structure of desire in the paradigm of completing the objectives, alongside the horror of death and losing the game, this medium is explored through the state of undeath that the cyborg subject enters between the continued life of Virtuality and the death drive of the terrifying Real. Using Deleuze and Guattari's notion of becoming, expanded here from becoming-animal (2004b, 256f) to becoming-death, a series of art games are analysed that challenge the traditional gaming structures and insert a critical conceptual or aesthetic rupture in the relation of the player towards digital death. This perpetual process and unattainability of death is followed by a discussion of the quantum immortal, as described by Max Tegmark (1998; 2007a) in his elaboration of Everett's many worlds theory. Where the quantum immortal cannot perceive its many possibilities of living and dying through any situation, in the digital medium the subject can simultaneously live and die, even reversing time to undo or relive a particular instance of death. This entering of a state between deaths, between the Virtual and the Real, is applied to the structures of desire in a close analysis of Valve Corporation's *Portal* series of games, in which an immortal artificial intelligence, built from a human-computer hybrid, torments the human character in a constant state of testing, dying and re-testing. The relation of humanity to purely digital being is interrogated in relation to the finality of death and its suspension in computer games, to expand the definition of the cyborg subject as a consciousness able to perceive and engage

with impossible superpositions of itself beyond physicality and mortality. Žižek's psychoanalytical project of staging the fundamental fantasy (in Wright and Wright 1999, 102-124), the structure supporting desire, is then interrogated through the digital medium in creating a space whereby the Real can emerge from beneath the Virtual surface of the purely human subject in a critical gesture of expression, self-destruction and rebirth as a self-aware cyborg subject.

The potential for the cyborg subject to extend beyond the boundaries of physical humanity is explored more fully in the fifth and final chapter, *The Impossible Subject*, which uses cultural representations of the digital, particularly speculative fiction, to assess the potential for reconceiving the relation of Virtual and Real. By applying Žižek's method of inserting a minimal difference towards a situation in order to critique it to Fredric Jameson's utopic construction of science fiction (2007), the development of cyberpunk is analysed as a critique of the state of digital culture. By positing a future system of thought relations to technology, and the various forms of subject and society that it might produce, a critical distance to the present allows for an assessment of the way in which the digital world is currently thought and the creation of a space into which another mode of thinking can be brought forward. Using Deleuze and Guattari's concept of a minor literature (1986; 2004b), the cyberpunk genre is confronted, with consideration given to the backgrounds of artists, writers and thinkers and the impact of their work between creative and scientific realms of inquiry in contact with developments in the cultural application and representation of digital technology. This is extended into recent 'hard science fiction' that speculates on the implications of different possibilities regarding the fundamental laws of physics and the potential horror embedded within the ontological role of observation for the engaged spectator. A study of Hannu Rajaniemi's work (2010; 2012; 2014a) draws these themes – the technological protagonist in literature, recent trends in science fiction and the positing of other modes of subjectivity – into confrontation with extensions of digital culture that suggest an awareness of the future of the cyborg subject in the fusion of Virtual and Real. The cyborg subject is thus interrogated as a potential step towards the posthuman: a method of thinking otherwise as consciousness engages freely across physical and digital (and possible other) realities. To draw the thesis to its conclusion, this chapter, through positing other and future modes of consciousness, forms a critique of the current mode of thinking digital technology and our relation to it, in order to answer the question of how the cyborg subject might critically and creatively confront the functioning of its own consciousness from the parallax position between physical and digital realities.

THEORETICAL FRAMEWORK AND TERMINOLOGY¹

The methodology dictates that a set of theoretical terms be defined for consistent use throughout the thesis. As previously discussed, efforts are made to reconcile apparently conflicting conceptions of thought and the psychological construction of the subject, and the precise understanding of the terms reflects this productive yet antagonistic relationship between parallel philosophical positions. Firstly, the relation between subject and consciousness is explicated, followed by the original schema of Existence, Meaning, Real and Virtual that constitute the functions of consciousness. These terms, emerging from the research as a suitable framework for discussion, are defined in relation to Žižek, Deleuze and quantum physics in order to construct a coherent set of definitions that can be used throughout the structure of the chapters. The relations between these terms are then delineated as their coalescence into physical and digital modes of consciousness and reality, followed by a discussion of the process of parallax itself in the formation of the cyborg subject.

SUBJECT/CONSCIOUSNESS

The first terms that must be defined involve the difference between the subject and consciousness. While they amount to the same construction of the cyborg as a contemporary extension of what is commonly designated 'human', subject and consciousness occupy specific roles within such a structure, as the void and the surface respectively. Consciousness is the process of thought itself as a series of machinic functions. It is the act of self-positioning that forms the surface of the subject as a pure Virtuality. The subject itself is, rather, the position from which consciousness is thought, the void of the parallax perspective and the assemblage of functions and worlds around such a void. This structure from and around which consciousness takes place is what Žižek describes as the cogito, "not a substantial entity but a pure structural function, an empty place" (Žižek 2009b, 8), yet from this vacant structure all manner of wondrous realities burst forth. If consciousness is the process of thought, it is the subject that announces '*ergo sum*' as the position from which consciousness speaks. The machinic nature of consciousness remains always a process, whereas the subject is a position. This position, however, is located in the gap between physical and digital worlds as a rupture

¹ A concise classification of these terms can also be found, with other terms bearing a specific significance within the thesis, in the Glossary of Terms at the front of this text.

at the heart of reality. Žižek labels this the “‘I of the storm’, the void in the centre of the incessant vortex/whirlpool of elusive mental events...the void that is nothing in itself...which nonetheless serves as the unrepresentable point of reference” (2006, 102). Applied to the construction of physical and digital within the functioning of consciousness (the ‘elusive mental events’), the subject thus appears as a cyborg: an expression of consciousness as the gap between and engaging with both worlds. The subject becomes an engaged spectator through consciousness, while consciousness functions around the void-core of the subject. The functions of consciousness – Existence, Meaning, Real, Virtual – can therefore be considered both essential to the creation of a subject and the way in which the subject is alienated from itself. As Žižek states, “the subject fails by definition” (2000, 117), for in order to form through the functioning of consciousness the subject must conceal the inaccessibility of its void-core. It is the nature of this functioning that must be scrutinised if the construction of the cyborg subject between physical and digital worlds is to be understood.

EXISTENCE

The first function is Existence, the being-function, that is, the first phenomenological step of engaged spectatorship that ascertains the being of the subject and the world it perceives itself to be in. This is also the ontological presupposition of the possibility of existence and the gesture of the gaze that suggests an external world and draws the subject into being in such a world. Jean-Paul Sartre, speaking of our relation to being as image, insists that “all consciousness is consciousness of something” (2004, 11), and this conception of an existence reliant on engagement has resounded not only through philosophy, but also quantum physics, in our understanding of the constitutive correlation between ‘perception’ and ‘perceived’, ‘observer’ and ‘object’. As Bohm suggests, “instead of saying ‘an observer looks at an object’, we can more appropriately say, ‘observation is going on, in an undivided moment involving those abstractions customarily called “the human being” and “the object he is looking at”” (2002, 37). The subject does not commit the act of Existence alone; it requires a world to appear before it. The subject is therefore as dependent on the object of Existence as the object itself. Yet this is not a consciousness of an external ‘objective reality’, but rather a reliance on a subjective engagement with the very conditions of appearance. This appearance-as-such fulfils Deleuze’s logic of denotation (2004b, 16), the stating of a particular external world by the subject, and the first form of consciousness for both philosophy and physics. Henri Lefebvre states that the subject “changes that which he observes” (2004, 25), echoed by Everett: “in order to say that an observer, *O*, has observed an event *a*, it is necessary that the state of *O* has become changed forever from its former state to a new state

which is dependent on *a*" (in DeWitt and Graham 1973, 63-4). Existence takes on here the negative connotations of collapse or decoherence as being constructs a limiting force on the uncertainty and potentiality of unknowable flux. This interdependent causal loop always leaves in appearance the mark of the void of subjectivity, what Žižek's ontological gaze describes as "traces of the subject himself...in the object" (2009c, 103). Existence therefore becomes the composite of the gaze and its conditions, the fact that something exists, in the active role of the individual through the positing of the self, mirrored in the object.

MEANING

The second function is here named Meaning, the communication-function, the sharing of experience between subjects and the conditions that make such communication possible. This is not the particular signifier attached to an object, but rather the possibility of truth that enables the process of signification. In conjunction with the being-function, the communication-function constitutes and presupposes an axis of existence and essence, thus positing ontology and epistemology respectively. This process of signification is founded not on an independent idea tied to a particular or universal object, but on the thought of the idea as it is posited as a function within consciousness. We might apply Deleuze's interpretation that "the logical value of signification...is no longer the truth...but rather the *condition of truth*" (2004b, 18). This condition of truth that establishes the positing within consciousness of an essence of the object thus always lacks actual truth. As Žižek states, "'essence' itself is nothing but the inadequacy of the appearance to itself" (2008b, 234), that is the necessary illusion of an impossible state in which an object is its own signification inherent to the symbolic order. Bohm's system of thought is of particular relevance here in the relation of the essential disjunction or distance of the signifying process within consciousness. He writes, "thought is incomplete...a signification, or an 'abstraction'...a representation of what you are thinking about" (1994, 92). Through a quantum physical lens, we can envisage Meaning as "a joint product of all the information that is exchanged between those who communicate" (Wheeler in Brown & Davies 1986, 68). Meaning is neither certain nor exact, but an approximation based on the possibility of truth as an emergent phenomena. information is therefore a flow or line, not passive or immobile truth but "active information" as a path to or passage through wholeness (Bohm in *Ibid.*, 128). The work of Baudrillard is of importance in this process of signification as the production of simulacra, in that it both "masks the absence of a profound reality" and "has no relation to any reality whatsoever" (1994, 6) in its nature as a process of thought on the surface of consciousness. We can attribute to Meaning a

quantising effect, forcing ideas into frames of signification for consciousness to communicate, the line of flow from subjects to each other and external worlds.

REAL

The third function relates directly to the subject as gap as the void-function of consciousness. The Real, as it is used in this thesis, is heavily influenced by the later Lacanian Real (Lacan 1977), though more specifically the *objet petit a* as the objectification of the void and its role in drive. If subjective reality is a void around which worlds form, then the Real is the absent or quasi-cause at the heart of the parallax that determines the manner in which reality appears to the subject. This Real is not an objective reality, but rather the excessive lack within the subject that presupposes an external causality. However, if, as Žižek states, “all presuppositions are already minimally posited” (2000, 119), then the Real is that which is presupposed as lost, what he labels the “coincidence of emergence and loss...*objet petit a*” (2008a, 15). Throughout Žižek’s interpretation of Lacan, the Real as *objet a* is the excess and lack of an underlying ‘Real-ity’: excess in terms of a mystical beyond or supposed causal force more than the subject; lack in its unattainable nature derived from its positing within (and objectification of the void of) the subject. From this position, the Real functions according to the logic of that which is expressed. This is Deleuze’s conception of sense which “brings that which expresses it into existence” (2004b, 190), “is essentially produced” (Ibid., 109) and “is always presupposed as soon as / begin to speak; I would not be able to begin without this presupposition” (Ibid., 35). Sense manifests the Real as a functional logic: that which is expressed, yet cannot be directly confronted; the object of the proposition that is not included in it; the quasi-cause of the void-function. This conception of the Real can be seen in the underlying reality of the quantum universe in which “all is flux...*what is* is the process of becoming itself” (Bohm 2002, 61). As Heisenberg warned, “one should be especially careful in using the words “reality”, “actually”, etc.” (1949, 15n), and his uncertainty principle elucidates that we can never ‘really’ know the state of things in the flux of quantum reality. The Real is the objectification of this flux within consciousness, and through Žižek we can arrive at the conclusion that “reality is never directly ‘itself’” (2006, 241). In this way the Real portrays a void-function within consciousness, the inaccessibility of the void of subjective reality.

VIRTUAL

The final function is the role of consciousness in perpetuating itself; the subject as process; the function-function of consciousness in which the subject imagines and posits its own

functioning. This function forms an axis of becoming, based on the desire that leads always towards the Real, yet never achieves its goal, in what Deleuze would call the Virtual. While this Deleuzian Virtual is taken into account as a function of immateriality operating within thought, its position within a schema of real and actual that relies too heavily on objectivity limits its direct transferral onto the terms as used here. The Virtual here is manifestation, the "I" of the enunciation as the establishing of the process of consciousness, a "statement of desire" (Deleuze 2004b, 17). Within the structures of consciousness the subject "imagines himself to be...merely by virtue of the fact that he imagines himself" (Lacan, 1977, 142). It is the functioning of consciousness that bars the subject from itself. This is the grand illusion of consciousness, covering over the inherent alienation of the subject from itself, concealing the void of subjectivity with the surface of consciousness. The Virtual thus takes on the role of the big Other, the structure of desire that is always already in the unconscious (*Ibid.*, 130). This predicate for the manifestation of the cogito as the enunciating subject does not exist outside of consciousness but supports the whole symbolic structure necessary for the subject to function. This internal illusion is echoed in quantum physics, where the Virtual forms the field of forces in which the scope of consciousness covers over quantum processes in the guise of 'classical physics', whereby the desire for empirically comprehensible links between theory and appearance necessitates a shift in thought. It is the Virtual that makes consciousness always-already false and, somewhat paradoxically, enables the subject to conceive of the substance of objective reality that obscures the internal positing of the assemblage of worlds, thus Žižek's conclusion: "reality always-already was virtual" (2007, 193). Indeed, all worlds are formed and all of subjective reality defined by the constant process of desire as the Virtual function of consciousness. As desire, what Deleuze and Guattari define as "a process of production without reference to any exterior agency" (2004a, 170-1), the Virtual both sustains the illusion of objectivity in relation to the subject and enables the subjective self that "exists only on the basis of the misrecognition of its own conditions" (Žižek 2008b, 73). The Virtual is the function-function of consciousness, its function *as such* essential to the assemblage of worlds and the creative formation of subjective reality.

PHYSICAL

The physical mode of subjectivity emerges when Existence combines with the Real, the world as it appears with an absent causality. Following the phenomenological dictum that existence precedes essence, Virtual-Meaning then occurs as a constructed truth within consciousness and its social relations. The entrance of consciousness into the physical world marks the initial passage from nothing to something, our first concrete Existence must be founded upon the

objectification of the void in the Real. This Real-Existence, the first stage of physical ontology within consciousness, is seen in terms of quantum physics: “what we experience is empty space. But this may also be regarded as the fullness of space, which is the ground of all existence. Matter is, then, a small variation on this ground” (Bohm 1994, 172). We see here an acknowledgement that physicality is brought into Existence as an appearance of solid matter out of an unknowable flux of the Real in an epistemological gesture of variation within consciousness. Thus “‘atoms’ are nothing but configurations of the void” (Žižek 2009c, 148), returning to the void once the moment of perception passes. This is Žižek’s quantum parallax whereby “the ‘appearance’ (perception) of a particle determines its reality” (in Sutton, Brind & McKenzie 2007, 188), and not only the particle or object’s reality but also our own physicality as subjective being. This appearance of physicality leads back into consciousness in the process of signification, the human desire for communication. This is where Virtual-Meaning is formed, in the process combining the conditions of truth with the functioning of consciousness. As Žižek states, “the multitude of ‘floating signifiers’...is structured into a unified field through the intervention of a certain ‘nodal point’ which ‘quilts’ them, stops their sliding and fixes their meaning” (2008b, 95). The Virtual, as desire and the big Other, acts as this condensing point upon and against which Meaning can be certified, wherein “by the mere act of speaking, we suppose the existence of the big Other as guarantor of our meaning” (Žižek 1991, 153). Our interpretation of the physical world relies upon this Virtual-Meaning. Signification must become manifestation and the subject must form itself in a relation to symbolic truth and presuppose an external validity to such truth in order to engage in the use of individual visual, linguistic and cultural signifiers. This process of creating a symbolic structure based on a presupposed external physical reality is the cycle of the physical world, whereby each moment passes from perception to thought before the Virtual returns to cover over the Real as signifiers define the framework for future observations and the signified world expands within a Virtualised consciousness.

DIGITAL

Conversely, the digital subject condenses when the Real combines with Meaning, the absolute truth in code. This binary causality only ever has indirect contact with the subject, through layers of programming language that are constructed to enable communication. This is brought into Virtual Existence not as a simulation but, rather, as a simulation-of-simulation; the appearance of appearance instigated by a conscious intentionality linked directly to the underlying machine code (in its most basic form this is the act of ‘turning on’ the digital device). This inversion of essence before existence still maintains the originary quasi-causality

of the Real followed by the process of the Virtual. The digital world is not built from material substance, but from the abstract and absolute code of the machinic computer. Such a formal, logic-based realm can be considered the fulfilment of electric technology as “pure information without any content to restrict its transforming and informing power” (McLuhan 2001, 57). Binary logic is “contentless and silent” (Heim 1993, 93), built upon the numbers one (being) and zero (nothing). Jameson tells us that “numbers have no content” (2007, 229), thus the being and nothingness of binary ontology are purely formal, in-themselves devoid of content, lacking. This is what Žižek calls the “minimal difference of part(s)/no part, 1 and 0” (2009a, 128), through the coalescence of Meaning with the Real in the fundamental positing of a digital universe. Virtual-Existence then appears as a realm of the imaginary in the superficial light of the interface screen. The purity of such a ‘perfect’ imaginary world based on formally ‘perfect’ logic fails at the very moment of engagement. The subject as physical being is seldom able to detach itself, neither sensorially nor cognitively, from its analogue Existence. Memories of ‘real’ places seep in, ‘realistic’ graphics hook our imaginations back into already established functions of (false) consciousness and we hold that “even a no-place must be put together out of already existing representations” (Jameson 2007, 24). However, this is a misguided short circuit of physical consciousness and analogue representations onto digital creativity, for “synthetic computer-generated imagery is not an inferior representation of our reality, but a realistic representation of a different reality” (Manovich 2001, 202). We should not consider Virtual-Existence as an illusory or imaginary interpretation of physical Real-Existence, for the relation of Real to Virtual does not here imply a judgement of truth. Rather, the digital image should be regarded as an illusion of appearance, the simulation-of-simulation whereby phenomena precisely are their signification in the primary causality of computer code. The Virtuality of Existence returns to the Real in concealing such presupposed code beneath the sensory data that appears on screen.

PARALLAX

Between these two modes of consciousness lies the subject: a cyborg perspective caught adrift in the void of both realities. A given world, whether physical, digital or any number of other potential domains, is a specific self-organisation or assemblage of the functions of consciousness. Beyond notions of materiality, physical and digital worlds do not, in themselves, differ ontologically. Rather, the specific ordering and condensing of the functions of consciousness creates a different knowledge and experience of each world, which precisely brings about the perceived changes between realities. The shift in epistemological position that creates an ontological difference between worlds is what we have seen in Žižek’s

conception of parallax (2009b, 17). However, where he applies this model to a cultural ontology of subjective positions within a social reality, here it is interpreted not as a shift between individual objects but a parallax of worlds as the subject exerts a functional causality from within consciousness itself. Throughout Žižek's work there is the basis for this framework of parallax and its relation to a machinic consciousness, in the proliferation of the "always-already" of posited-as-presupposed conditions (for example 2008a, 184), as well as the Lacan-inspired role of fantasy in cyberspace (Žižek in Wright & Wright, 1999, 104-123) and as "a screen masking a void" in reality (Žižek 2008b, 141). This structure of fantasy is of crucial importance in assessing the fundamental relation within consciousness that allows the subject to form: the Real and the Virtual. Fantasy, then, becomes the illusory structure between desire and drive that allows the Virtual to cover over the void of the Real in the continued functioning of consciousness, on the surface of the subject. What a critical approach of parallax aims for is the insertion of a "minimal difference" (the noncoincidence of the one with itself)" (2009b, 11), under which a distance to our own subjective position can be achieved and the void-core (around which the parallax is centred) exposed. To break through the structures of fantasy in relation to digital technology is the purpose of this thesis, in a confrontation with the smooth functioning of consciousness in such a way that makes clear simultaneously the parallax relations to physical and digital worlds within subjective reality. By approaching the various relations of the functions of consciousness to each other and the subject in general, as well as their role within the fantasy that is the subject, a critical distance is inserted within the cyborg subject as it beholds its position in the void of parallax between physical and digital worlds.

1 THE OPEN SUBJECT MEDIA(TION) BETWEEN WORLDS

This chapter sets out the defining shift in the functions of consciousness that differentiates physical and digital modes of reality: the inversion of Existence and Meaning. The shift in alignment of these with the Virtual and the Real is shown to control the fundamental forces at play in each reality. In either world, mediation is integral to the formation of the subject. The control of this inversion of function is analysed in the self-mediating processes of consciousness that allow both realities to form around the parallax subject. Therefore concerns over mediation by digital technology should be secondary to the internal functioning of consciousness in concealing its own machinic processes and the illusion of separate realities in the parallax of physical and digital worlds.

To effect a change in consciousness, achieving a critique of self-mediation rather than a simple statement of digital mediation, the chapter assesses a series of works that act as cultural interventions upon relations internal to consciousness itself, rather than political interventions attempting to act directly upon social or technological forces. By setting aside concerns of the conflict between specific ideologies – and the additional forces of desire defined by their location in social reality – and by reducing the analysis of mediation to those forces internal to consciousness, a critical distance is sought from the smooth functioning of the subject, in which the mediation of consciousness by technology can be confronted within the mediation of consciousness by itself.

The inversion of Existence and Meaning that establishes the conflicting physical and digital ontologies is outlined in Žižekian terms as the disruption of materiality in contemporary thought. This is pursued through Deleuze and Guattari's nomadology, applied to the shifting landscapes of the cyborg world, and through quantum physical questions raised in theorising multiple levels of reality and their simultaneous engagement. The analysis of Benayoun's work shows one attempt to overcome the borders between physical and digital that exist in current consciousness, suggesting alternative modes of viewing digital technology as extensions and expressions of collective thought. The chapter concludes with further consideration of the role of self-mediation, returning to the research question – how physical and digital worlds differ in their relation to consciousness – to support the ongoing discussion of the position of the cyborg subject within parallax reality.

1.1 REMEDIATIONS OF THOUGHT

Any philosophy of the digital and its creative use by an engaged subject must, fundamentally, be a philosophy of the techno-semantic mediation of consciousness. Any creative practice that engages with such mediation is thus a confrontation with the assemblage of subjectivity across mind, world and technology. Benayoun labels art as “an advanced form of human mediations” (2012a) and thus an appropriate object for analysing the cultural relation of digital technology to the consciousness of the human subject. The remediation of thought by itself through technology is the manner in which art emerges from subjectivity, spanning physical and digital modes of expression in mapping a specific assemblage of the functions of a consciousness and its relation to others. In the parallax of the contemporary subject, (digital) art acts as a cartograph of the underlying functions and perspectival position of a given subject or groups of subjects. The cartography of language has defined the age of human consciousness, bound by the schema of the physical world into the machinic functioning of Real-Existence and Virtual-Meaning. Through the inversion of Existence and Meaning in digital technology, a schematic of Real-Meaning and Virtual Existence emerges. We are now entering the age of cyborg consciousness, defined by cybernetic mappings through the hybrid technological territories of a fusion of physical and digital consciousness. This is not a rapid shift. Language took thousands of years to develop and so too will the cybernetic age take many more years to fully evolve. Now only in its infancy, a technological singularity remains distant, yet digital technology is ever permeating our lives, ever expanding our consciousness. Guattari hails this “age of planetary computerization” as creating “a machinic subjectivity of a new type” (2013, 11). While language has a tendency towards linear modes of thought, the immaterial and fluid maps of cybernetic communication open up a rhizomatic potentiality to creative consciousness.

What impact will these new digital technologies have on cyborg consciousness? It might be said that the subject loses its nomadic potential as ever-expanding databases secretly hoard information purporting to define each individual human, and the increasingly ubiquitous devices we all bear track our movements along stratified confines of corporate and state machines. It might be said that humanity itself is being stratified and codified, traced and territorialised according to the whims of power and the structures of fantasy and desire that are made manifest within the digital realm. However, the blurring of digital technologies with human consciousness will be shown to generate potential tools for a nomadic approach

to subjectivity, expanding the very notion of humanity by enabling a move outside the interiority of traditional conceptions of human consciousness. Technology generates both the dilemma and possible solutions, such that it is its relation to the desires of the cyborg subjects using it that defines its purpose. The grand structure of technology as an abstract machine acts as a big Other (Lacan 1977), which in its nonexistence appears as the Virtual function of consciousness. It is thus the self-positing of the subject that brings the use of technology into specific roles of oppression or salvation, destruction or creation. The position of subjective parallax as it relates to technology within consciousness determines the measure of any such uses. The role of thought in mediating itself defines any theory of technology, and provides the underlying split between physical and digital. The cyborg subject, appearing through the self-positing assemblage of the functions of consciousness, creates the gap between physical and digital worlds through its own reorganisation and remediation.

1.1.1 REALIGNING REALITIES

The realignment of the functions of consciousness that forms the differentiating factor between physical and digital modes of reality is the inversion of Existence and Meaning. The creation of the digital realm in code by human subjects according to the system of logics developed by centuries of conscious thought places binary Meaning as presupposed. The Real of the digital, the absent presupposition, is Meaning rather than Existence – code rather than being. The digital world as such is merely an unseen stream of ones and zeroes organised according to preordained principals. As Simon Pope and Matthew Fuller describe, “Computers are embodied culture, hardwired epistemology” (1995), or rather, the digital world, created from the assemblage of human culture (including language, logic, mathematics, etc.), is only our knowledge of it. Thus Virtual Existence arises when we make the conscious choice to ‘know’ the world the code contains, to unleash digital ‘being’ on screen. Here the self-positing nature of reality is brought clearly into view as consciousness wittingly creates and recreates the semantic world of the digital in its appearance through the chosen interface. In linking this presupposed and primary Meaning to the Lacanian Real as the psychological underpinning of what appears to consciousness as ‘reality’, Žižek attempts to define the ultra-nominalism of Deleuze’s Idealism in contemporary society as a form of ‘spectral materialism’:

in the information revolution, matter is reduced to the medium of purely digitalized information; in biogenetics, the biological body is reduced to the medium of the reproduction of the genetic code; in quantum physics, reality itself, the density of matter, is reduced to the collapse of the virtuality of wave oscillations (Žižek 2012, 22)

The permeation of human consciousness and its engaged worlds by digital technology, which includes the elements of the physical world made observable only by digital technologies

(genetic code and subatomic particles), brings the reduction of all being to its primary code (of Existence to its presupposed Meaning) directly and abruptly into the assemblage of consciousness. Our initial experience of the world, in which Existence precedes Meaning, what Sartre describes as “the primacy of existence over essence” (2003, 12), is invaded by the functioning of digital consciousness, to the extent that Meaning begins to override Existence, entangling the interplay of Virtual and Real in the inversion. Žižek (in Davis 2009, 89) further identifies in quantum mechanics, particularly in Heisenberg’s ‘uncertainty principle’ and opposed to Einstein’s relativity, a necessary ontological gap within this assemblage of reality (rather than a gap in quantum theory as was Einstein’s accusation). Žižek exemplifies this through digital reality, in which the only ontological necessity is that which is included in a subjective perspective at any given moment in time: the rendering of only exterior surfaces of simulated human figures rather than full inner biology; the inexistence of text scrolled beyond the screen. This is seen, in both quantum and digital worlds and against our familiar ‘concrete’ primary experience of classical physical reality, as the primacy of Meaning over Existence, whereby the appearance of the world becomes solely that which is necessary for communication in connection with the Real as the presupposed conditions of such a reality.

The rapid expansion of digital technology in its relation to consciousness and our engagement with reality necessitates the development of new methods of thinking human consciousness and what it means to be a subject in cyborg society. Heim tells us that “technology is, in essence, a mode of human existence” (1993, 60), and the contemporary subject must negotiate and critique these new modes of Existence in relation to Meaning from the parallax position around which the functions of consciousness shift and form cybernetic reality. In Meaning, technology is thus a form of Existence, whether it is computer code or its use in developing codes of genetics or wave functions. Virtual-Existence appears from Real-Meaning within consciousness, adding what Heim labels a “new layer of reality” (*Ibid.*, 118) that must be seen as an integral part of the new subjective assemblages, yet viewed critically in its relation to the construction of a self-aware and engaged creative consciousness. If consciousness, and what it means to be a human subject, is changing in the wake of digital technologies, a creative intervention is necessary in guiding our modes of thinking about technology, humanity and society. In light of these issues, the technologist Negroponte identified that, amidst the vast creative potentialities for digital technology in relation to human subjectivity, “the real opportunity comes from the digital artist providing the hooks for mutation and change” (1996, 224). Heim, referring specifically to digital worlds under the now outdated term ‘virtual reality’, also raised the importance of the role of art by suggesting that “perhaps the essence of VR ultimately lies not in technology but in art...to redeem our

awareness of reality" (1993, 124). This must avoid a nostalgic redemption of a lost 'physical reality' within the flexible and ever-evolving digital world, instead emphasising an awareness that the construction of subjective reality by consciousness requires a negotiation and creative exploitation of digital technology in order to comprehend the new and ever-changing complexities of the assemblage of subjectivity around individual parallax perspectives.

1.2 CYBER-WAR MACHINES AND VIRTUAL NOMADS

1.2.1 TOOLS TO WEAPONS

The relation of the human subject to technology is built upon its conditions as part of a presupposed assemblage of worlds and purpose. This is an innate mediation of consciousness by itself. The enslavement of the subject by the Virtuality of its own functioning, the big Other of thought, acts as the stratifying, codifying and limiting factors attributed to the imaginary Otherness of state and capitalist machines, reducing technologies to their most crude function as 'tools' for production. Deleuze and Guattari (2004b, 435-45) define the use of the same technology as either a tool or a weapon. The tool is moved by the subject in a relative speed of linear displacement: a set task with a scope of change limited to the preordained purpose of the territorialising and stratifying functioning of consciousness. By contrast, the weapon is always moving in an absolute speed along with the subject: a manifestation of force in space and time as a free action with unlimited scope. The definition of any single technology as tool or weapon is derived from its presupposed purpose, what Deleuze and Guattari state as "the machinic assemblage that determines what is a technical element at a given moment, what is its usage, extension, comprehension, etc." (*Ibid.*, 439). This is 'the self-mediation of consciousness', with the individual functions and specific technologies as technical elements in the machinic assemblage of the cyborg subject. In the functioning of the subject it is the presupposed formation of the assemblage that defines its purpose. Just as physical and digital worlds are defined by the placement of Existence or Meaning in line with the presupposed Real (which is the presupposed as such), so too are the technologies with which we might engage bound to the modes of thinking presupposed by their purpose as part of the subjective assemblage.

It is the role of critical digital culture to challenge this systemic remediation of the subject in relation to itself in general and the digital in particular. Michael Betancourt points

out that “the digital is a semiotic realm where the meaning present in a work is separated from the physical representation of that work” (2010), which is an alternate expression of the distinct alignment of Real-Meaning and Virtual-Existence within our functioning consciousness of the digital. The image of a digital work of art is only ever an appearance of appearance. Though the work’s underlying Meaning may be separated from its visual representation (its Virtual-Existence), the representation is exactly defined by the Real-Meaning of absolute code. Thus the work appears as a simulation-of-simulation, whereby the Existence, the visual image, of the work is inextricably derived from the meaningful interpretation of code. This certainty generates an inherent problem regarding communication by digital means, for the fixity of the digital echoes the imagined fixing of semantic content in all human communication that seeks to remove subjective interpretation. However, it is the mediation according to the logic of (state/capitalist) tools that defines the certainty of the digital, concealing the Real under the big Other of the computer system. The task of a critical culture is to break and reveal this system of desire in a *re*-mediation of the technology as a nomadic weapon that moves across the potentialities of genuine intersubjective Meaning and allows contact with the Real. One such work is *Gift Horse* (2013), the proposed ‘Fourth Plinth’ work by Hans Haacke:

Instead of the statue of William III astride a horse, as originally planned for the empty plinth, Hans Haacke proposes a skeleton of a riderless, strutting horse. Tied to the horse’s front leg is an electronic ribbon which displays live the ticker of the London Stock Exchange. The horse is derived from an etching by George Stubbs, whose studies of equine anatomy were published the year after the birth of the reputedly decadent king, whose statue was abandoned due to a lack of funds. Haacke’s proposal makes visible a number of ordinarily hidden substructures, tied up with a bow as if a gift to all. (Greater London Authority 2013)

The initial commentary revealing the inner Real of the structure of the horse – perhaps a sculptural visualisation of a strand of horse DNA would function more completely, if less explicitly – combines with a critique of the role of London as a military and economic centre of power and desire. The intrusion of the digital element, however, inserts the critical use of code made visible as a ‘gift’ to the people of London and visitors from around the world. The work converts the medium of the plinth, the equine statue and the digital display into a weapon that disrupts the functioning of the location and stock market, revealing the role of desire in economic production and gift-giving as a non-functional work that references the nomadism of the horse and the war machine.

Deleuze and Guattari insist on the necessary non-functioning of desiring machines and relate this disruption of systems to artistic critique, whereby “desiring-production is used to short-circuit social production, and to interfere with the reproductive function of technical machines by introducing an element of dysfunction...breaking down is part of the very functioning of desiring-machines” (2004a, 34). The displacement of location through a

'misuse' of technology – converting the tools of economics into weapons of art – emerges through an act of interference against the mediated functioning of consciousness confined by the big Other of its own Virtual structures. Chris Land explains that the machine “only exists in relation to the flows that it emits and breaks” (2005, 29), in an inherent and critically necessary move towards a nomadic conception of technology and its relation to subjects and their worlds. One such (ab)use of this nomadic, weaponised functioning of machines in a more strictly digital setting is the intervention by Eva and Franco Mattes, as radical art collective 0100101110101101, on the United States government. The work *404 – Justice* (Mattes and Mattes 2001) exploits a hack of the pentagon website, whereby entering the url <http://pentagon.osd.mil/justice> returns a 404 error with justice apparently 'unavailable' at the US department of defence. The artists later pasted screenshots of the result across Düsseldorf (2011), invading the Real-Existence of physical space with the Real-Meaning of the digital hack. This artistic defrauding of an online resource fits into a larger repertoire of reappropriation of other websites, other artists and even themselves in the use of the internet as a cultural weapon that constantly shifts the Meaning of data in relation to the Real of a series of remediated subjectivities.

Explicitly political and activist interventions – such as the 'blackout' on 18th January 2012 against SOPA and PIPA legislation, by Wikipedia, Reddit, Wired, Wordpress, Mozilla and partially by Google and Flickr – act upon the internal social or technological relations in themselves, regardless of the world they are played out upon. Cultural interventions, however, achieve their critique by their very failure in confronting social and technological relations, thereby acting on the individual consciousness directly, with social change as a contingent by-product, rather than aiming for social change as activism does without unleashing an expression of the Real in digital Meaning. The blackout event, protesting government control over digital information, as well as any number of digital 'sit-ins' by organisations such as the Electronic Civil Disobedience group, can only fail in their direct confrontation of state/capitalist machines, for their own desire is linked directly to the desire of the oppressive big Other, a Virtual problem acting only on appearance. The cybernetic cultural intervention, however, in expressing the inexpressible, succeeds in its necessary failure, for it turns itself into a new desiring-machine that breaks itself down as it breaks down the systems it critiques. Art and culture have the potential to embrace the digital mediation of consciousness by itself, directly in confronting the Real of code and the potentialities of open Meaning as a creative weapon before it becomes caught in the predetermined tools of Virtual Existence. It is necessary to creatively re-write the conditions of critique and mediation in order for the subject to change the modes of thinking it is ready to accept. In order to confront

the digital world in itself, art must act on the level of Real-Meaning, the excessive loss of code, and thus bring into view of consciousness the parallax position of the shifting assemblage of Existence and Meaning through the interplay of Virtual and Real.

1.2.2 ANTI-SOCIAL NETWORK

But how does art insert ambiguity into Meaning through the strictures of code? This seemingly paradoxical situation, whereby the very rigidity of binary logic reveals an open potentiality, is formed from art works being situated as the full digital assemblage of Real-Meaning and Virtual-Existence between the functioning consciousness of many different subjects, each with their own breaking down desires and semantic assemblages across which the work moves. It is contact with the Real (the objectification of the void of subjectivity) made possible through art that enables this remediation of the potentiality of the digital world. If, according to Deleuze's propositional logic, Meaning is understood as signification, the conceptual implication that enables connections across propositions and across subjects (2004b, 18), then it is the signifying process of code that creates the interpretable links across the gaps of and between subjects. Real-Meaning (as computer code) presupposes a framework of understanding out of the chaos or void of each individual subject, unifying different propositions not through the specific signified interpretation but through the presupposed possibility of the process of sharing knowledge. Code thus exists as signification in its simultaneous excess, over the totality it represents (Lacan 2001, 139), and lack, as disappearance (Lacan 1977, 218): the impossible rigidity of absolute truth as the conditions for the possibility of truth are lost in the desire for a specific reading. Between subjects, the digital artefact is the creation of a cognitive space in which two or more assemblages of consciousness both posit the potentiality of connection and a sharing of the expression of subjectivity. This expression, however, when it makes contact with the Real of the human subject, appears as a connection with the terrifying void-core of the other subject.

The fixing in code of such horror constructs an assemblage of trauma with which the spectator can engage, respond or ignore. This horror is exemplified in the work by 0100101110101101 titled *No Fun* (2010), in which a video chat user shows a man who has hanged himself. This online performance work incites a range of reactions: shock at the anxiety of human mortality confronting the subject directly on screen; mocking laughter or sceptical disbelief at a supposed prank (or perhaps displaying a more sociopathic response); ignorance from those who simply continue the self-indulgent narcissism of a perpetual soliloquy to an anonymous and irrelevant other. The failure of most users to engage with the

'performer', to commit to a social assemblage with the void of and between the Other, is demonstrative of the inability to accept the void within their own subjectivity. The presupposed truth of the code that carries the disturbing images of the video feed to the individual user requires a different mode of engagement in the act of digital perception. As Virtual-Existence, the gaze is linked to the functioning of consciousness, a cognitive perception whereby the image must be thought by the subject. *No Fun* forces such a cognitive interaction with visual stimuli in order to comprehend what is occurring, while leaving the interpretation of the fixed images open not only to the computer processor that converts the ones and zeroes into the visual output but also to the subject that observes the performance by presupposing the physical other in the video chat window. In making contact with a primal human concern, derived directly from the void of subjectivity, the assemblage crosses physical and digital modes of thought in a short circuit that promotes a genuinely cognitive engagement with the perception, interpretation and interaction of the digital work between the physical performer, physical viewer and the mediation of the digital space in which the



Fig.1 No Fun (2011) © Eva and Franco Mattes
Video chat partners react to Franco Mattes's apparent suicide, ranging from panic to disbelief.

work occurs.

Enacted fully, works that draw subjects into such a shared space create both an anticipatory unity of a shared assemblage and an exploration of the antagonistic parallax nature of the separate subjective positions. This is what Rancière describes as both the “direct anticipation of ‘being together’ in ‘being apart’” and the critical process of “constructing the work as the very tension between the apart and the together” (2011, 78). This aesthetic creation of a community-through-separation is the full force, ultimate conclusion and underlying horror of Marshall McLuhan’s “global village” (2001, 5): a ghost town filled with the spectres of subjects in which expression breaks down production to reveal desires. When this desire is the social itself, we approach what Deleuze and Guattari label ‘the people yet to come’. They discern that “there is extracted from chaos the shadow of the “people to come” in the form that art, but also philosophy and science, summon forth: mass-people, world-people, brain-people, chaos-people” (1994, 218). This chaos of which Deleuze and Guattari speak is the void of subjectivity, the inherent nonexistence of consciousness and worlds from which all assemblages emerge and which can only be observed as a shadow in the Real.

A further work by 0100101110101101 makes clear the chaos from which an anticipated people may spring, while inserting a stark critique of the ‘apartness’ of online ‘communities’. *Freedom* (2010), an online performance in which computer game players are asked not to kill the character while he films an art piece, reveals the worrying attitude towards communication and the social (even between those supposedly on the same ‘team’). A string of individual players, or groups who take offence at this reappropriation of the gaming discourse, kill the performer with little hesitation, as if removing this alternate way of thinking the medium will return the order of clear objective-based repetitive gaming activity. As the performer attempts to communicate with the other players, asking to be allowed to film his work, the verbal response by the gamers echoes their actions. The collective here is formed only through action, and that action is killing, thereby displacing the death drive onto an anonymous other. Communication of this future people appears as murder. As a performance this reveals not a film in the style of a machinima set in the game world but a critique of the nature of this collective assemblage between individual subjects separated by physical space. This is a non-community that, despite the suspension of disbelief inherent to avatar- and game-based activity, reinserts the apartness of these subjects acting ‘together’. The work succeeds as a non-work; the inability to complete a performance turns the performance itself into a series of rapid endings and abrupt conclusions that open a space within the definitions of ‘apart’ and ‘together’. The title, *Freedom*, takes on a particularly apt role in its attempts to open up a space of debate around the construction of online gaming ‘communities’. As Bohm



Fig.2 Freedom (2011) © Eva and Franco Mattes
 The artist's performance is repeatedly short-lived as the gaming 'community' swiftly and violently reject the player unwilling to conform to the structures of the game.

suggests, "freedom is the creative perception of a new order of necessity" (1994, 120), and *Freedom* forces a new mode of thinking the very terms of the online social assemblage. The construction of a critically engaged 'people' through art, philosophy and science requires a nonart, nonphilosophy and nonscience (Deleuze and Guattari 1994, 218). These nondisciplines are formed from a rejection of the framework in which the question is asked, the insertion of what is inaccessible to each field in a step towards a constructive interdisciplinarity, or indisciplinarity (Rancière 2008), through a confrontation between the plane of thought and underlying chaos, the tension of the Virtual and the Real. This is demonstrated in the works by 0100101110101101, derived from the same shadow of the Real in the void of the elusive parallax position. The Real of the digital social space is the absence of the social amidst the solipsistic emergence of individual subjects, made visible only by revealing the parallax position of the single consciousness in relation to others as part of the future-social assemblage.

The very language used to construct the culture of such digital social assemblages emphasises the need to look to the parallax positions of the individual subjects and make connections across the gaps within and between subjectivities. The term 'internet' itself suggests an infinitely expandable assemblage with a focus on the 'between' rather than the individual nodal points, highlighting the importance of connections *across* space over the specific spaces involved. This is furthered by the French term for an internet user, particularly one who is adept at manipulating the technologies: an *internaute*. The link to the ancient

Greek word for sailor displays the subject engaged with digital technology as a 'between-sailor', a nomad moving across shifting landscapes. The sea-faring imagery seen also in the term 'surfing the net' further recalls the basis for the term 'cybernetics', described by William Ashby as "the art of *steermanship*...it treats, not things but *ways of behaving*" (1957, 1). The derivation again from Greek sailing terminology places the engaged cyborg subject in control, allowing for a nomadic rethinking of the human user under its own remediation of the self in relation to technology. There is an inherent rethinking of the nature of space at play in digital culture, towards what Deleuze hails as "no longer a division of that which is distributed but rather a division among those who distribute *themselves* in an open space – a space which is unlimited, or at least without precise limits" (2004a, 36). Jay Hetrick summarises this in specific relation to a nomadic art as an "unpartitioned distribution" (2012, 37), which can be applied to the digital in the very construction of the conceptual framework and creative and social space in which we engage. The self-positing nature of the subject must not become fixed in the Meaning of code, but embrace the potentiality of communication as a possibility in connection with the Real of the subject. Virtual-Existence then emerges as a mobile thought-gaze that is nomadic within landscapes that are themselves ever shifting into new subjective, collective and creative assemblages.

1.2.3 SELF-DESTRUCTION

This embracing of nomadic behaviour and creative control over the manifestations of subjective engagement across physical and digital worlds establishes a seeming antagonism with technological devices. Instilling a set interpretation of binary logic is necessary in order for computers to function and interact, which enforces the appearance of absolute fixity on code that often obscures the subjective void and the possibility in communication that presupposes Real-Meaning. The focus of art on unveiling this psychological void of humanity, the gap between physical and digital worlds, thus creates itself as a seemingly (self-) destructive process. This is epitomised in the performative nature of WORM Rotterdam's *Web 2.0 Suicidemachine* (2009), an application that systematically deletes the user's entire social media existence. This is an act of utter destruction, rather than simply closing or archiving as is the case with many sites such as Facebook, where a seemingly 'deleted' account can be reopened at a later date. Against the rigid fixity of technologies that confine the individual subject to a series of data points in a globally accessible database, this closing of the user opens up the use of code to signs of dissent against the economic and cultural structures of the mediation of humans by digital technology according to state/capitalist machines and allows a nomadic flight amidst the symbolic representation of self-destruction. Žižek insists

that such annihilation is the only ethical act and the only work of art possible to the subject aware of a parallax reality (Žižek 2009a, 76 and 128). In such gestures, the engaged subject removes a part of itself from the assemblage of worlds, the 'stain' of the parallax perception whereby the observer appears in the world as gap (*Ibid.*, 17). The creative process of such a removal, constructing the subject as an assemblage across worlds with the perspectival gap brought into cognition, thus forms a self-conscious remediation of the functions of consciousness in critical opposition to the simple mediation of the subject by technology. The appearance of objective realities can therefore be reconstructed in a creative gesture as part of the emergence of a new subjective reality.

1.3 PARALLAX THOUGHT IN PARALLEL WORLDS

1.3.1 REDEFINING THE PARAMETERS

New methods of thinking the apparent solidity of 'objective' reality have been at the forefront of scientific theory for the past hundred years. Even earlier than explicit interpretations of quantum theory, Thomas Young's 'double-slit experiment' (1802; 1807, 457-71) established the theoretical foundation for both the wave/particle duality and the integral role of the observer in defining the material world. The expansion of science into quantum mechanics has brought many questions concerning the nature of Existence, the role of the Virtual in defining it, the underlying Real of the universe and our understanding of its Meaning. Lying outside our everyday experience, the role of consciousness has proven increasingly complex and fervently debated in relation to both the objective and subjective conditions of reality. A key interpretation of this dilemma is the de Broglie-Bohm theory, established by Bohm as the 'hidden variable' theory (1952). While Bohm's developments attempt to remove the role of the observer, the focus on a hidden or implicate causality and a simultaneous wave-and-particle reality display great similarity with an observer-dependent construction of Existence between two forms of reality (to Bohm wave and particle or classical and quantum; here physical and digital) through a parallax of the material universe governed by the nature of the observation between two apparently contradictory states coexisting according to an unobservable factor. Bohm's labelling of this theory as a 'causal' or 'ontological' interpretation of quantum mechanics displays the role of his 'hidden variable' within subjective experience as the Real of all realities. Mark Buchanan states that no interpretation of quantum theory yet defines how superpositions occur, or even which variable (position or speed, according to

Heisenberg's uncertainty principle) is superposed, but that "neither picture is more correct than the other" (Buchanan 2007, 17). What is brought into the defining role becomes the structure in which we make such decisions: the problem of the appearance of materiality or its potential for truth and its understanding. This is the core ontological-epistemological debate that defines philosophical study, and it is also the problem of the inversion of Existence and Meaning between physical and digital worlds. The unknown position from which we view such shifts, the void of subjectivity, forms the key dilemma which neither philosophy nor science has been able to resolve. Critical digital culture takes this unknown position as its subject, expressing the multiplicity of an observer's viewpoint; opening the engaged creative subject to the parallax of its wave/particle duality, its uncertainty and its hidden causality, through the very failure of expressing the inexpressible. This superposed dualism that maintains both sides of the antagonism simultaneously is seen in the expression of Real-Meaning against Virtual-Existence through technological mediation and subsequent subjective remediation.

The *Art is Motion* (2013) project by Sergio Albaic for the Lexus IS 300h converts the car, a key signifier of technological innovation and objectified movement in contemporary culture, along with the computer, into a creative medium.² The generative art piece reconstructs a photo of the driver according to the nature of their driving style: speed defines the accuracy and abstraction of the brush strokes; the choice of electric or petrol engine shifts towards 'colder' or 'more virulent' colours respectively; acceleration speed and RPM insert red and blue strokes for aggressive or gentle driving. The remediated face constantly evolves over time, emerging as a fixed work through the motion of the car. From the initial digital photograph to the final image uploaded to the project's website, the mediating forces of the driver, the technology (of the work and the car) and the rules of the artwork set up by the artist in the rigidity of the code transform the human and its interaction with the environment into a real-time art work. The links to nomadcity are made clear, while the position of the 'artist' is obscured. Is the creator of the work the designer of the code (Albaic), the car-manufacturer (Lexus) or the driver? The position from which the work is viewed displays a parallax of Meaning depending on whether the image is seen in real time or in its final incarnation, as a wave or a particle, and differs when viewed as a visual expression or as a collection of data (the speed, RPM and engine hybridity values over time are also collected for analysis by Lexus) according to the potentiality of the stream of fixed values determined by the physical experience of the driver. The everyday interaction with a physical vehicle in the physical world is reduced to the Real-Meaning of data, mediated by the Real-Meaning of the work's code and

² See <http://www.artismotion.com/> for a video of the project and examples of the works.

constructed as a Virtual-Existence both in the car and online. The artist defines the project as “the construction of the identity as a hybrid between genetics and experience, which will be represented by a photograph of the driver and the driving experience” (Albaic in Lexus 2013). The layering of multiple Meanings, of genetic disposition, interpretation of the driver and code of the work, is combined with the Real of the subjective experience and its unknowable position, to highlight the position of the individual subject across worlds. The participant engages with a series of Real-Meanings derived from a cultural assemblage surrounding the work. Bohm says of Meaning, that “in society we have a culture. I say a culture is basically a *shared meaning*” (1994, 189), foregrounding the role of possibility and potential assemblage that emerges through the interaction of subjects and their worlds. Wheeler, a proponent of the ‘many worlds’ interpretation of quantum mechanics, further defines Meaning as “a joint product of all the information that is exchanged between those who communicate” (in Brown and Davies 1986, 68), emphasising the collective assemblage that in contemporary global society spreads out through digital media across space and time, across social particles and waves into a flexible assemblage built around the perspectival gaps between subjects.

However, the flow of information in *Art is Motion* remains under the control of stratifying capitalist machines that seek to fix Real-Meaning as data points that track the movements of the driver through the collected information, reducing the mobile subjective experience to a static set of particles to be used to increase profit. Furthermore, the entire project rests in the realm of advertising, inserting corporate desire into the Real of the subjective viewpoint that is expressed through the work, tainting the free and open critique of the parallax of physical-digital worlds. It is possible to locate similar relations between technology, the subject and the antagonistic superposition of parallax worlds in the work *Google Street Ghosts* (2012), a purposefully nomadic and artistic intervention by Paolo Cirio. The ongoing global project uses images of human subjects as seen in Google Street View, selected for their obvious disruption of or disjuncture with their physical location. These images are printed and pasted onto the location in which they were originally photographed, converting the Real-Meaning of the code that is gradually fixing the streets of the world within the structures of Google’s databases into a Virtual-Existence between physical and digital locations. This is further remediated by Cirio photographing the new images fixed into their physical location and displaying them digitally on the project website, appropriately displayed as pins on its own Googlemap. This triple expression of subjects deemed excessive to Google’s codifying of world space, labelled as “victims...obscure figures...biopolitical surplus” (Cirio 2012) by the artist, explicitly engages and critiques the multiple layerings of realities and their respective control by the original subjects, corporations and the artist. The

exploitation of exploitation offers a creative intervention in the fixing of the digital by “confronting the public with the aesthetic qualities of the data” (*Ibid.*) to make clear the parallax of physical and digital worlds and the superposition of iterative remediation between subjects, worlds and technologies. What is brought into play through this process echoes the ‘decoherence’ that governs the blurred lines between quantum and classical realities, what Phillip Ball describes as “a sort of leaking away of quantum behaviour when a particle interacts with its surroundings” (2008, 23). This disappearance of the underlying nature of matter that physicists are constantly trying to observe and explain is the same process that Cirio is attempting to bring into view through “ghosts haunting the streets and sometimes reappearing from the ethereal hells of digital archives...the murky intersection of two overlain worlds” (Cirio 2012). The presupposed causality of a subjective engagement with a world or environment, whether (classical or quantum) physical or digital, will always revert to the state of ‘hidden variable’ in the void at the heart of parallax reality.



Fig.3 Google Street Ghosts (2012) © Paolo Cirio
 Images of people stored as ‘ghosts’ in Google Street View are pasted in place, photographed, and displayed online as the digital spectres are shifted between worlds.

1.3.2 ALTERNATE WORLDS AND SYSTEMS

The artistic intervention that moves towards a glimpse of the parallax position, the perspectival hidden variable at the core of subjective reality, constructs its affective force in disrupting the functioning of consciousness through the simultaneous construction of multiple alternative realities. Buchanan states that “a growing number of physicists, especially those working in quantum information and cosmology,” (2007, 16) turn to Everett’s ‘many worlds’ interpretation of quantum theory to sustain this multiplicity of realities, what Deleuze expresses in art as “a question of different and divergent stories, as if an absolutely distinct landscape corresponded to each point of view” (2004b, 297-8). Everett’s theory (in DeWitt and Graham 1973) removes the need for a ‘collapse’ into fixed particles, sustaining the superposition of the wave function by postulating a new and distinct world for each

potentiality. David Deutsch, who extrapolates a series of simultaneous worlds from this notion, embraces the multiplicity of actualised superposition:

In this view...our Universe is only a tiny facet of a larger multiverse, a highly structured object that contains many universes. Everything in our Universe – including you and me, every atom and every galaxy – has counterparts in these other universes. (in Buchanan 2007, 16)

This sustaining of the inherent antagonism created at the quantum level by wave/particle duality and the unknowable flux underpinning all forms of reality is embodied and expanded in the digital realm, where human subjects shift seamlessly between worlds that in physical reality are inaccessible. However, the user can not only shift between different 'worlds', such as teleporting from one location to another in virtual environments such as Second Life or between different server locations in MMORPGs such as *World of Warcraft* (2004) – in which server choice defines the rules of the chosen reality that govern player-to-player interaction (specifically levels of violence allowed between players) – but there is also the possibility of viewing multiple worlds simultaneously. Expanding our definition of 'world' in the semantically-defined digital realm controlled by sets of Real-Meaning, the creation of the 'window' on the interface screen allows a vast number of spaces to be viewed simultaneously. Text, images, videos, interactive environments and other spaces all enter the gaze-space of the screen, their antagonistic differences in code or medium held in suspension without 'collapsing' into one mode of being. Virtual-Existence thus takes on a multiplicitous nature as if we are simultaneously viewing conflicting universes.

This notion is culturally expressed in relation to the functions of desire in the *120 days of *buntu* project by Danja Vasiliev and Gordan Savičić (2011). Highlighting the awarding of the Golden Nike to the open-source Linux operating system as an art work in the Ars Electronica festival in 1999, the artists have instigated a series of 'OS interventions' that seek to draw out the paradoxes within the apparent economic and creative freedoms of open-source operating systems as an engaged choice, themselves earning an Honorary Mention at the same awards in 2011. The use of code as an art form and intervention enacts the dilemmas facing human construction of and interaction with the Real-Meaning of computer code. As artist Florian Cramer has commented on the project:

Each mutation of the computer operating system becomes a statement...enforced onto people's everyday work environment, as if one was wearing a straightjacket or were forced to do carpentry with a hammer that had been oddly constructed for political-poetic reasons. (Cramer in Vasiliev and Savičić, 2011, 12)

The creation of 120 different incarnations of the Ubuntu distribution unveils a vast array of desires at work in the interpretation and framing of the Real-Meaning at a fundamental level of the digital world and the constraints it places on the Virtual-Existence of the human subject as user. Examples that directly target the Virtuality (desire) of art and the digital, seeking to

make contact with a subjective Real through the exploitation of code, include *whitecubebuntu*, which acts as a blank canvas in visually “expanding the curatorial vacuum of the world famous commercial galleries into conceptual software-art which eventually will unite art, life and software” (Vasiliev and Savičić, 2011, 52), or *aabuntu* and *firebuntu*, which use ASCII graphics to visually reconstruct the screen. Several are of particular note to the Real of code: *mondrianbuntu* uses colourful divisible panes to enable multiple simultaneous command-line applications in a neoplastic conceptual space; *rebuntu* creates a fractal repetition by continually reloading copies of itself within itself; *shufflebuntu* uses the code-defined ‘random number generator’ to erratically and autonomously control the computer as a self-operating-system; *dadbuntu* converts every value on every available memory to zero, thus rendering the entire system as the void beneath reality. Between these conflicting, contradictory, and essentially useless systems lies a critique of the role of the subject in choosing the conditions of its own digital reality, highlighting the constricting impact of such a choice and the emergence of bizarre expressions of the digital Real through the exploitation of the fixity enabled by entrenched Meaning.

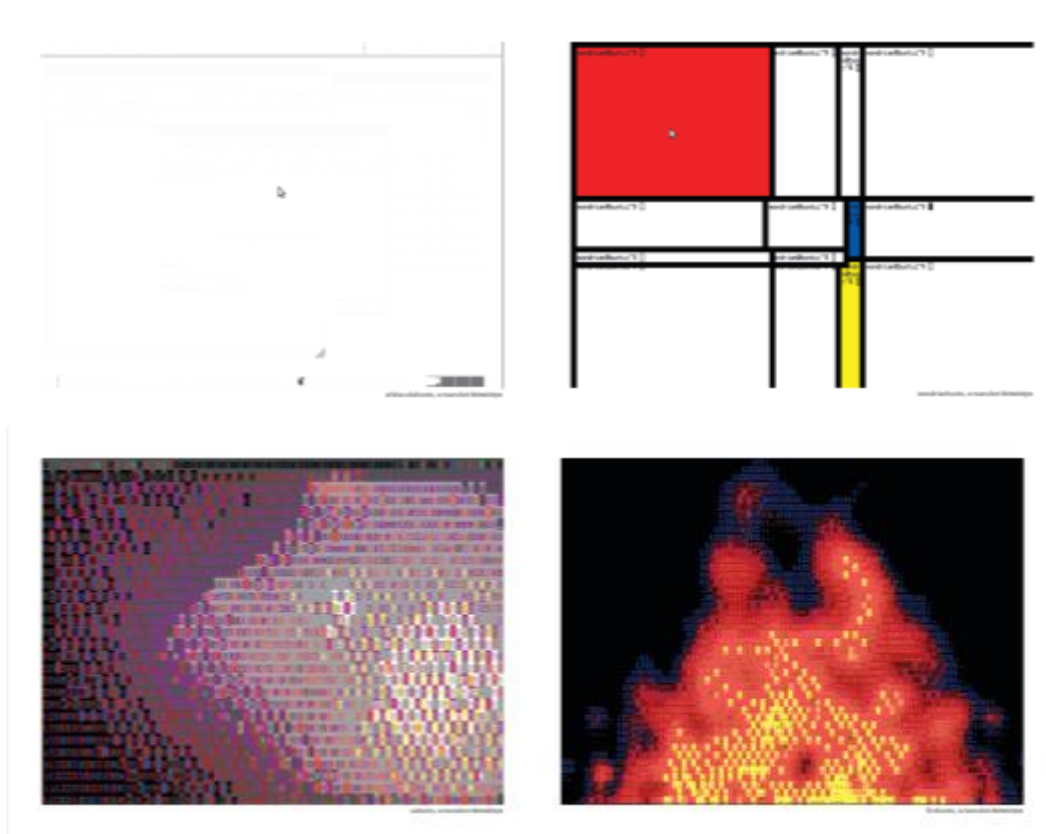


Fig.4 the 120 days of *buntu (Creative Commons)

[Attribution Unported license 3.0: <http://creativecommons.org/licenses/by/3.0/>]

(2011) Danja Vasiliev and Gordan Savičić

Alternative operating system interfaces: (clockwise from top left) *whitecubebuntu*, *mondrianbuntu*, *firebuntu*, *aabuntu*.

This rendering visible of the constraining impact of code acts as the fixing of Real-Meaning that risks losing contact with the indeterminacy of the Real. The *120 days of *buntu* project as a whole forms an instructive critique of the construction of digital worlds, but each individual distribution falls into the certainty of a truth-based Meaning that removes potentiality. One attempt at maintaining the critique while also sustaining a potentiality is offered in projects by Marko Manriquez that utilise moss as graffiti in an on-going artistic practice highlighting the parallax position in relation to the Meaning of data in both physical and digital worlds. The 'Tactical Moss Graffiti' work *Ecology Without Nature* (2012) disrupts urban physical spaces as custom-made moss grows naturally as a harmless parasite on postindustrial buildings, yet within the living elements are a variety of sensors that monitor air quality, pollution and radiation, with the results viewable online or in Augmented Reality. The gap between material and semantic worlds is crossed, highlighting the rupture of thought-perception itself as we negotiate and undermine the physical landscape of a world in the grip of digital capitalism. An earlier version of the work, *Moss Invaders* (2010), takes a more overtly digital tone, with the moss creations shaped like Space Invaders and containing touch sensors to play 8-bit sound effects. The imagery makes a clear comment on the cultural disjuncture between ecological and digital universes, and the data collected displays an awareness of the fragility of the physical world. Bohm states that "fragmentation is now very widespread, not only throughout society, but also in each individual" (2002, 1-2), and the works by Manriquez show the flexibility of signification surrounding our understanding of the Meaning of these fragmented worlds within our own individual subjective experience. Inserting themselves in two universes simultaneously, the parallax parasites of the moss creations form expressions of the Real and its alignment with the inversion of Existence and Meaning across both planes: the organic (physical) realm governed by the genetics of the moss intruding as an inverted stain of life through its growing Existence in the decaying landscape; and the digital realm governed by the code in which the data collected finds Meaning in its signified inclusion of the online availability of the project. The use of Augmented Reality to display the collected data superimposes a Virtual-Existence over the physical world, remediating the Real once more across fractured experiences of multiplicitous realities. Concerning the prevalent fragmentation in our world(s), Bohm adds that "the notion that all these fragments are separately existent is evidently an illusion" (Ibid.), highlighting the emergence of the assemblage of parallel worlds through the thought processes of the Virtual function of consciousness within itself and across the gap of subjectivity. Thus he suggests that, in the construction of realities, "in some sense each region contains a total structure 'enfolding' within it." (Ibid., 188). This approaches what Deleuze labels the fold, which is the inseparable relation of the subject to Being (2006a, 90) as the doubling of thought creating the space of

the subject (O'Sullivan in Parr 2010, 107), which in turn can be associated with parallax ontology where the subject appears as the inherent stain in and against the world it beholds. This is the assemblage of subjective reality from ever-shifting functions inverted, overlapping and folding one another within the constantly evolving Virtuality of consciousness.

1.3.3 SELF-AUGMENTATION

The creative use of Augmented Reality, such as Manriquez uses to display the data collected in his moss-based works, challenges the current technological and cultural conceptions of the nature and role of the computer within our physical and social reality. As computers become increasingly ubiquitous, the traditional view of the physical world is being overlaid with the perpetual presence of the digital. This is a shift from a window into the digital towards a cyborg window of digital parallax over or alongside the physical. The extension of hand-held devices, touch-screen surfaces and the direct perception alteration of technologies such as Google Glass are logically extended into the realm of AR, and creative interventions that utilise the increasing availability of AR enable a greater potential for making contact with the Real that underpins all forms of reality. Work that has made significant moves towards this superposition of fragmented universes includes the uninvited AR exhibition *WeARinMoMA* (2010) at the Museum of Modern Art organised by Sander Veenhof and Mark Skwarek. The 'invasion' of the gallery space by an explicitly Virtual-Existence has prompted questions of ownership at such sites of conflict, prompting MoMA's response with a notification: "No augmented reality beyond this point please" (in Veenhof and Skwarek 2010), although the uninvited curators actively encouraged independent artists to add their own layers of parallel virtual exhibitions and Veenhof's collaboration *Augmented Reality Flash Mob* (2010) with Johannes La Poutre and Tobias Domian is referred to on MoMA's website, mentioned as part of their own AR and Communication Design exhibition *Talk to Me* (2011), as part of what is labelled an increasing practice of "information parkour" (MoMA 2011).

This nomadic movement and uninvited appropriation of space utilises the increasing flexibility of Virtual-Existence as the codes available in Real-Meaning become more elaborate, to the point that "AR' technology allows anyone to (re-)shape anything, anywhere!" (Veenhof and Skwarek 2010), as demonstrated by the exhibition *I Occupy* at Kasa Gallery in Istanbul, which assesses the layered critique and artistic intervention of not only physical urban space but also socio-political landscapes. While the direct link to the Occupy Movement establishes its own codified agenda, the exhibition's critique of what constitutes occupation of a conceptual space and its expansion into other worlds retains a similarly instructive relation to

ontological artistic parallax as *WeARinMoMA*. The focus of the works in *I Occupy* (2013) is global interventions and the transcendence of physical and political limitations on art, combining institutional critique, radical politics and the social construction of technological society. The force of technology is shown not only to be marching ever-forwards in the tools that are available, but creates opportunities to render the conceptual grounding of conventional boundaries and divisions of space as obsolete. The question across the gap between physical and digital, and within any given individual or social reality, becomes a matter of “redefining the aesthetic and cultural understanding of the environments we operate in” (Aceti 2013). Just as quantum physics has necessitated a radical conceptual rethinking of the nature of the discussion on reality, so too is art seeking new forms of expressing the void of subjectivity between any and all conceivable realities. The contemporary digital artist attempts to move freely across spatial and social constraints, through the abstractions of data and arbitrary divisions of culture, and into the simultaneous perception of individual realities as part of the subjective assemblage.

1.4 MAURICE BENAYOUN: THIS IS NOT TECHNOLOGY³

1.4.1 NOT OBJECT, NOT IMMATERIAL

This interplay of Existence and Meaning in the shifting realities of physical and digital consciousness is articulated by the artistic and theoretical work of Maurice Benayoun. Since his early work, *The Quarxs* (1991-3), which is counted among the first 3D computer animated series, Benayoun has explored the collision of alternative modes of thinking physical, digital, semantic, biological and emotional realities. Drawing on his scientific background, *The Quarxs* literally tackles this notion through the creation of a fictional set of entities from “a world in which the great principles of physics, biology and optics find themselves out of place and ridiculous, ignored, altered into opposites of themselves” (Benyoun 1991). This use of digital technology challenges traditional notions of the construction of reality through absurd, parodic representations of the ‘popularized science’ programs that have brought scientific information into the home in an accessible format, marking a shift in mass media from analogue to digital modes of creation, a theme that reoccurs in Benayoun’s theoretical conceptions of technology as the “sudden appearance of reality in fiction (reality shows, news

³ The subtitles for this section refer to key statements in Benayoun’s essay *Art After Technology* (2008).

shows, documentary dramas)" (2008). This relation of Meaning to Existence is disrupted in a step towards what Benayoun sees in technology as the "possible *fusion* between fiction and reality" (*Ibid.*). This is a crossing over of Meaning and Existence within digital art and its relation to traditional physical mass media, moving beyond the objective world while remaining also short of the truly immaterial. The computer graphics in *The Quarxs* are used to stage impossible physical relations, shifting our perceptions between and beyond both physical and digital worlds. There is an emergent reality at work here, an artistic and subjective space in which the possible is made manifest without actualisation.

This space of what Benayoun labels "the concept artist" as opposed to "the conceptual artist" (2006a), in which the art work need not be actualised in order to be effective (or affective in relation to altering our perception of the universe), entails a stepping outside of reality into the realm of consciousness and ideas. Meaning is preceding Existence in Benayoun's digital works, yet the conceptual construction of reality in which his oeuvre is situated lies between the structures of Existence-to-Meaning and Meaning-to-Existence. His use of technology and its interaction with impossible reconstructions of our modes of conceiving reality rests in the space of cybernetics, in its conception between material and mental worlds. As Ashby stated in the early stages of cybernetics research, "cybernetics started by being closely associated in many ways with physics, but it depends in no essential way on the laws of physics or on the properties of matter...the materiality is irrelevant" (1957, 1). This is the effect of Benayoun's disruption and interpolation of Existence and Meaning. The relation of this cyborg practice to the classical laws of physics is nomadic, shifting not only into quantum mechanics and biotechnologies but also beyond all known scientific paradigms into the pure Virtuality of creative consciousness engaging freely across shifting landscapes of flexible worlds.

Benayoun extends this critical conflation of realities in the search for spaces of consciousness between fixed worlds to his conception of the construction of space itself. Through the image and text of transarchitecture project *Missing Matter* (1998), which visualises and theorises a digital manipulation of space, Benayoun suggests that "Virtuality is reality before it is going to happen. Virtual architecture deals with information and communication. Its material are meaning and exchange", creating what he calls "infra-reality" in which "the virtual is a personally directed world, loaded with meaning: more human than real" (Benayoun in Brouwer *et al.* 1998). This expresses the dominance of the Virtual over the Real in the internal relations of the functions of consciousness within subjective reality. The use of digital technology in Benayoun's work suggests this opening of a cybernetic space in which consciousness can confront itself, using the distortion of Existence and Meaning to

reveal the quasi-causal interaction and realignment of Virtual and Real forces in forming specific worlds and spaces. This discussion of immaterial objecthood is developed through a series of telepresence works by Benayoun. Starting with *The Tunnel under the Atlantic* (1995), in which the Pompidou Centre in Paris is linked with the Museum of Contemporary Art of Montréal as a combined video-link and shifting digital tunnel on screens embedded in the apparent ends of a two-metre diameter physical tunnel. The interaction between physical spaces occurs not through the ocean or the earth's crust, but through "a block of symbolic matter in which the geological strata leave the place to iconographic strata" (Benayoun 1995). This construction of a 'televirtual' presence, in Meaning rendered visible as Existence in digital symbolic space, exemplifies what Natalie Bookchin and Alexej Shulgin demanded in net art as "Immediacy. Immateriality. Temporality" (1999). There is here a disruption of the familiar physical landscape through the nomadic intersection with digital space, as if a wormhole is being opened through a symbolic dimension. In this challenge to the materiality of our Existence in the physical world, Benayoun explains that "free from the physics constraints, Space then is a function of Time. There, speed is not the best way to speed up the meeting, but a way of specifying everyone's position within information" (Benayoun 1995). While the ends of the tunnel are static, and the link between the two places masquerades as a direct, linear, spatial connection, the construction of the digital tunnel opens a space within the interaction whereby the specific material and the very conception of 'material' may shift around the semantic interpretation of the Real-Meaning through which the subjects pass and by which the Virtual-Existence appears to disrupt the Real-Existence of the physical gallery space.



Fig.5 Tunnels Under the Atlantic (1995) ©Maurice Benayoun
The interface, embedded in what appears as a physical tunnel, connects Paris to Montreal, allowing communication through the 'substance' of both the earth's crust and the digital medium.

The work was recreated as *The Paris-New Delhi Tunnel* (1998), linking the Cité des Sciences in Paris with India, exposing the Parisian observers to a new range of cultural 'material' through which to communicate. The concept was then expanded to a global array of connections in *Tunnels Around the World* (2012). Benayoun insists that this new work

“doesn’t mimic the original “digging” tool” (2012b), but rather forms an actualisation of the original intention of the project using newly available technologies. Connecting Seoul, California, Hong Kong, Montréal, New York and other sites, the work is transformed from a single tunnel that carves a set path through one exchange of cultural material to a shifting network in which the landscape itself becomes truly nomadic. The images themselves have become, instead of textures on ‘solid’ tunnel walls, slices to be passed directly through. The tunnel itself has become immaterial and symbolic, creating depth simultaneously in visual and semantic dimensions of the “psychological environment” (*Ibid.*). By further expanding the work in its online public version after the initial exhibition, the tunnels have become a conceptual embodiment of the gap between physical and digital worlds, a space of subjectivity where Existence and Meaning are constantly intertwined. The Virtuality of Benayoun’s telepresence model, in its construction of a new conceptual and psychological space between physical and digital worlds stages what Pickering labels “cybernetics as ontological theater” (2010, 381). The performative nature of the cybernetic interaction is made clear in both the burrowing through symbolic and visual matter and the interaction with the global other. Benayoun’s aim in his work, and his suggested aim for art in general, is the “dematerialisation of the sensitive and reification of the intelligible” (2008), seen in the tunnel works as a contact with the Real in the cybernetic space of consciousness made visible through our interaction with others across and within the gaps of subjectivity. While the conventional structures of the computer screen, in the fixity of Real-Meaning under state and capitalist machines, often turns the interface window into “a forcing device for the behaviour of the user” (Fuller 1997), Benayoun’s deconstruction of the immateriality of the digital world, bringing the symbolic into view as a substance that can be dug into and peered through, pushes towards a freeing of the gaze through technology. As he suggests, “it may be that we will discover that important technological changes often have an effect that is not necessarily technological in character, but gives another reading of the universe” (Benayoun 2008). Through the artistic intervention in the modes of perception that have become entrenched in

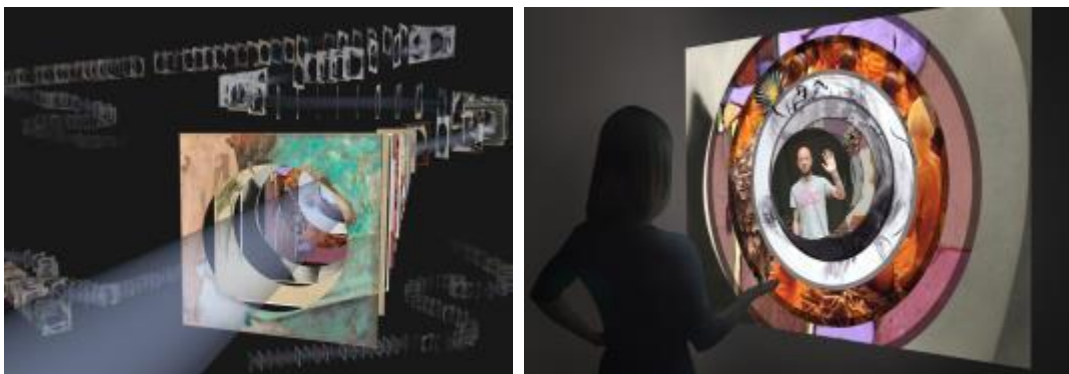


Fig.6 Tunnels Around the World (2012) ©Maurice Benayoun
The tunnels here are a more abstracted and obviously digital construct displaying the complex web of global information networks and cybernetic communication.

human behaviour, new spaces can be created that open the subject into new universes and thus new methods of spectatorship of our own present universe. The conversion of technology as a tool into a nomadic weapon against the rigid self-mediation of consciousness allows for a new critical space from which to view our ontological parallax.

1.4.2 NOT CUT OFF FROM THE WORLD

This remediation of consciousness, even into the space created between worlds in art, does not sever consciousness completely from the engaged worlds in which it interacts. The spectator must always be engaged. Just as consciousness creates physical and digital worlds within subjective reality, presupposing the externality of one or many universes, so too must consciousness construct itself in relation to such worlds. While worlds and consciousness are Virtual entities, their conditions are mutual in this Virtuality of the self-positing subject. Benayoun's work *Stolen Life* (2006) demonstrates this need to maintain an engagement with both worlds even while attempting to create a space in between to reach a critical distance towards our engaged parallax position. The work contains two rooms, two conceptual worlds. One contains a tree with computer-controlled lighting and watering. The other allows a spectator to enter, thus triggering the light and water and keeping the tree alive. Images are taken and displayed on screens outside the rooms each time there is movement of the spectator or the tree (when, for example, a leaf falls). The tree's continued survival depends on the engagement of the spectator. If the spectator is not in one world, neither world can exist. The work approaches Bohm's notion of utopia, in which "communication would take place as a creative act" (1994, 223), which is here extended to the on-going participation of spectators in communication with the world and the tree. Benayoun derives the project from the rise of two concepts in contemporary creation: "the first is the idea that it is the spectator who creates the picture and the second is that the life of a creation can be dependent on its owner (the Tamagochi)" (Benayoun 2006b). It is worth noting here Žižek's placing of Tamagochi as god, a technological big Other (in Wright and Wright 1999, 108), the Virtuality of a non-existent entity that controls and mediates desire through the signals of an engaged communication. The desire of *Stolen Life* is that the subject be in the world, in the work, and thus bring about self-positing emergence of a creative communication between the engaged spectator and both physical (tree) and digital (computer controlled environment) worlds.

The visibility of the work to the external world, however, emerges positively and negatively: during a spectator's engagement; after a time of dis-engagement (the tree is dying and leaves fall). Here Benayoun is making clear the antagonism of a parallax between

the 'survival structure' and 'observation structure' of the work, between a dying tree and the flow of spectators whose temporary engagement passes through the worlds of the work as a point on their nomadic line of the Virtuality of their own continued consciousness. The partitioning of the work and its display on two distinct screens could thus be said to create the effect of what Deleuze and Guattari describe as "a kind of *deframing* following lines of flight that pass through the territory only in order to open it onto the universe" (1994, 187). The very structures of the 'frame' in *Stolen Life* bring to light the desire for continued engagement within one specific arrangement of worlds (the rooms of the work) while acknowledging the impossibility of such permanence in the necessarily nomadic and fleeting nature of each individual spectator's engagement. The work displays the tree to the outside world only as it dies, promoting an emotional engagement of the spectator across the mediated space in the causal relation of the individual to the death of the tree, a possible sense of guilt arising from the ontological responsibility of engagement that underpins parallax reality in the causal gesture of subjective reality.

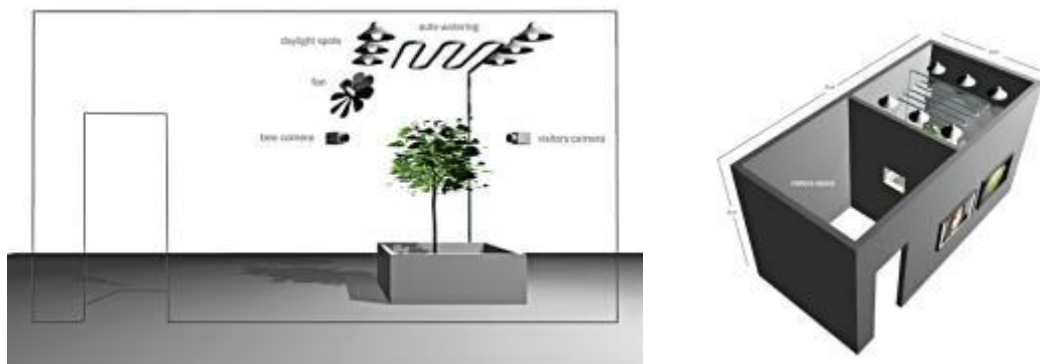


Fig.7 Stolen Life (2006) ©Maurice Benayoun

The tree and the artwork are inversely dependent on the spectator's engagement; the tree's life is dependent on a spectator's presence, while the artwork is visible only when as leaves fall and the tree dies.

This shifting interrelation and interpolation between the constant realignments of Existence and Meaning within the structure of the Virtual and the Real within consciousness, displays an increasing permeation and permutation of digital and physical worlds by one another. What we conceive as two separate worlds, held apart by the gap within consciousness, is becoming a blurred assemblage of fragmented worlds that coalesce around the void-core of the human psyche to form subjective reality. Benayoun acknowledges this process as an increasing 'impurity' of digital technology:

This impurity might characterize the mature stage of the medium, and the merging of the virtual and the physical world is probably the extension of the human trend of converting the objective environment into an informational system. These concerns affect the art world as well. The artist is more and more involved in the development of the understanding of medias, creating new interfaces, adapting the narrative and the building of meaning to new media, bringing the breaks through coming from technology far from the pixel, the sound sample, and the HMD [head-mounted display] straight to the other fields of human activity. (Benayoun 2001)

These conversions between worlds across the parallax gap of consciousness reveal a great deal in the nature of their translation. The creative intervention that brings the evolving nature of technology into art, broader cultural significance and everyday life displays a trace or stain of the artist making such a conversion, defined by their own parallax position as engaged spectator of worlds. Benayoun engages with these notions in *The Art Collider* (2010) project. Utilising 'IN/OUT' research at CITU, the project enables a collaborative and experimental 'peer-to-peer' creative network, whereby one collaborator (research institute, artist, etc.) takes an input of data from another user, enacts a creative process upon it and outputs it to another collaborator. The inputs and outputs can be a range of media, including text, image and sound feeds, while the processes occurring in the 'black box' of the individual subject evolves the input or converts it into another medium (for example, converting a stream of text into images drawn from a database or online search engine). This unseen process, in the Real-Meaning of the individual institution's server, is not only the code of a specific process but the unobservable parallax position that underlies any human-world system. As Ashby describes in relation to cybernetics, "what is being suggested now is not that Black Boxes behave somewhat like real objects but that the real objects are in fact all Black Boxes, and that we have in fact been operating with Black Boxes all our lives" (1957, 110). Any and all systems between a subject and a world it constructs contain unobservable (quantum/psychological) variables and forces.

The transition across the gap of a subject in *The Art Collider* is the creation of impurities, the nomadicity of the work emerging across a landscape of functions that convert each computer in the network from a tool to an affective weapon (Deleuze and Guattari 2004b, 435f), a force that deterritorialises the data and the medium itself in its constantly shifting remediation between locations and specific manifestations of information. In doing so, the project is attempting to redefine the nature of art as an emergent process across the gaps within the world created by human cognition of the digital, insisting on subjects' engagement in the evolution of cultural paradigms. Another such adaptation and corruption of the cultural notion of space is seen in Benayoun's concept art work *Art Total* (2010), taken from *The Dump* (2006a), an ongoing online repository of unrealised works existing only as Idea without the need for concrete actualisation. The *Art Total* concept is to fill a gallery space with an inflatable structure that exactly replicates and fills the entire physical space. It is impossible not to see the logic of the digital medium here intruding on physical space.

The filling of the gallery moves beyond similar conceptual works, such as Walter De Maria's *New York Earth Room* (1977) which inserts a large quantity of earth 56cm deep into a highly urban gallery location, or Martin Creed's *Half the Air in a Given Space* series (1999;

2007; various others), which half fill a gallery with balloons. While the *Earth Room* juxtaposes forms of physical space and a disjuncture of landscapes, *Art Total* recalls a digital image file where even blank space is filled with data for every pixel. While Creed's balloon works use a similar method of filling the space, they appear as a collection of partial objects that spectators can walk through compared to the impenetrable surface of Benayoun's inflated BwO. The excess of Benayoun's work within the gallery renders the entire exhibition invisible, only accessible to a spectator through any glass walls the gallery might possess (Benayoun identifies a glass-walled gallery as the ideal location as it confronts the audience directly with their inability to enter the space). Thus the excess of the Real reveals a lack of usefulness, weaponising the gallery for artistic purposes beyond the 'tool' logic of a productive space for an audience experience. The negation of perspective inside the work brings forth a literal void of parallax whereby the spectator is disengaged from the world by its very fullness – a simultaneous lack and excess that denies and critiques our engaged spectatorship – exposing the world as a whole as a lost object. As Lacan insists, "the *objet a* in the field of the visible is the gaze" (1977, 105), and common throughout Benayoun's work is the exposure of the parallax position as the stain in the world despite the subject's necessary engagement with it. The denial of the gaze in penetrating the work forces our perspective into a nomadic relation with art as a force which always emerges as process through and across worlds. The disruption of Existence by Meaning in these works displays an insertion of digital modes of thinking the world even into the familiar physical environment in a short-circuiting of the modes of consciousness.

1.4.3 NOT FINISHED

The attempts to reconfigure consciousness evident in Benayoun's work display a concerted effort toward challenging current conceptions of the self-mediation of the engaged subject as artist and spectator. There is an emphasis in his writing (2001; 2008) and art practice (for example *The Mechanics of Emotion*, 2005) that it is the role of consciousness in the cultural relation of humanity to technology that defines the structures of mediation. The overt rejection of technology by art only serves to cement the importance of technology in its entangled relation with contemporary consciousness. As Benayoun insists:

One of the important impacts of technology on art will probably be the absolute refusal by the world of art to accept it, and there are already a large number of projects flourishing that are low tech and unplugged and for which it is difficult to ignore the fact that technology is too visibly rejected for it not to be the true subject matter. (Benayoun 2008)

These attempts at the denial of technological mediation highlight the integral role of technology in the cyberneticisation of contemporary subjectivity, and its removal from works

places the subject without technology as an *objet a* in the functioning of mediation as such. This gives rise to an increasing nostalgia of the physical world, particularly prevalent in films such as Andrew Bujalski's *Computer Chess* (2013), praised for being "endearingly fetishistic about analogue technology" (Hayden in British Film Institute 2013, 62), whereby the physical world and thus 'pure' physical subject is considered a lost object. What this superficial critique of technological mediation conceals, however, is the innate mediation inherent to consciousness, in the self-positing Virtuality of human subjectivity. Benayoun's work, by contrast, targets the overlapping mediations of physical and digital worlds and modes of consciousness to make contact with what is Real in both dimensions of the contemporary cybernetic subject. Benayoun's bold claim, in what is a prolific output of clearly technological practice, that "this is not technology" (2008) demonstrates his true concerns: the future of art in general is tied to the development of technology as part of the overall progression of society (/culture/space/reality) and how we (re-)think it.

This rethinking of the nature of consciousness in and as the world is developed through Benayoun's long, and thus far unfinished, series of works *The Mechanics of Emotions* (2005), described as "an art opera in 15+ parts – each part can be a statement, an event, an installation, an object, a concert, a performance, a web site, a business..." (Benayoun 2005). The works posit the entire structure of the internet as a global nervous system for a collective unconscious, placing the Real of computer code in contact with the Real of the physical human experience and the Real of the parallax void itself. As a series of interventions, the works embody the processual nature of weaponised digital art in which Benayoun views the work as "constantly in progress, not in the making" with its "completion in emerging symbolic processes" (Benayoun 2008). The functioning of *The Mechanics of Emotion* therefore performs the construction of a Meaning-based emergent collective reality on a global cognitive stage. Works from the series, such as *Emotion Forecast* (2010) and *Occupy Wall Screens* (2011) utilise live feeds drawing statistical and symbolic data from the internet to display the real time variations in a range of emotions across over three thousand cities worldwide. Beginning as a weather forecast, this information is also displayed as and juxtaposed to the real-time stock exchange to identify the indirect proportionality of the relations between economic and mental growth. The reduction of humanity to data alongside the raw numerical data of economics is contrasted to the perceived situation in occupied physical space (particularly those sites involved in the 'Occupy' movement). The resistance to economic pressures attempts to posit the independence of human expression from (and against) productive state and capitalist machines, instead revealing the fluid and temporary nature of emergent subjective assemblages out of the self-mediation of contemporary society.

These works display a desire to connect with a Meaning that is both presupposed beneath the emotional data and constructed through the very act of its signification: the affective Real as the causal relation behind emotions-as-data. Deleuze and Guattari write:

If nerve connections and cerebral integrations presuppose a brain-force as faculty of feeling coexistent with the tissues, it is reasonable to suppose also a faculty of feeling that coexists with embryonic tissues and that appears in the Species as a collective brain. (1994, 212)

It is the construction of the signified value of the data in Benayoun's work that presupposes, and thus creates, the collective brain itself. By positing the internet as a global nervous system, these works also posit the Real from which such a collective cognitive system can emerge: not only analysing the current situation but suggesting a 'people yet to come' through the remediation and reappropriation of physical and digital worlds. If the construction of subjective reality is formed from the Virtual and exists as a self-sustaining Virtuality of consciousness, then it is necessary to consistently construct and reconstruct forms of cultural consciousness that engage with the shifting manifestations of Existence and Meaning in defining our parallax positions of viewing realities. As Benayoun's early writing claims: "L'artifice est une modalité du monde. C'est le versant damné du réel. Un effet de l'art [Artifice is a mode of the world. It is the damned side of the real. An effect of art]" (Benayoun 1996, translation own), and it is the Virtual artifice, the self-positing of consciousness as such, that constructs the world in opposition to the Real. The perpetual structures of Virtuality that mediate consciousness by itself are never complete in their concealing of the Real. The construction of worlds is the construction of art, a cognitive self-mediation of the subject.



Fig.8 Emotion Forecast for Urban Screen (2011) ©Maurice Benayoun
Statistics representing psychological states in cities around the world are displayed in a live global stock exchange of emotions.

Benayoun's work aims to create such Virtualities while making contact with the Real of emotional/digital/physical 'data', disrupting the current smooth running of consciousness to open up a critical space for new modes of expression and thought to emerge.

1.5 SELF-MEDIATION

The role of a cultural intervention in the relation of digital technology to consciousness is thus twofold: firstly, to construct a mapping of the interplay and inversion of Existence and Meaning within the Virtuality of thought in self-positing consciousness; and secondly, to create a rupture in any such new structures through which contact with the Real of subjectivity might be made. This necessitates shifting the subject between worlds, disallowing any settling on a stratified mode of consciousness in fixed reality. The nomadic shift of such a subject can then be used to bring into view new perspectives on the position of parallax that defines the subject's view on any reality, the framing of observation and spectatorship as such, in order to gain a critical "minimal distance" (Žižek 2006, 11) towards it. Exposing the noncoincidence of the subject and its engaged self within worlds levels the immateriality of both physical and digital worlds, whereby the inversion of Existence and Meaning, of denotation and signification, only occurs within consciousness itself. Beyond this, a symbiotic relationship between worlds can occur at the symbolic level, whereby the antagonism of parallax is maintained through the fusion of desubstantialised consciousness with its functional engagement within reality. Žižek outlines this effect as a result of technology:

What looms at the horizon of the "digital revolution" is nothing other than the prospect that human beings will acquire the capacity of..."intellectual intuition": the closing of the gap between mind and reality, a mental process which, in a causal way, directly influences reality. (in Davis 2009, 276)

What is at stake here is not the development of technology apart from human subjects. The digital world is neither an alternative nor challenge to the 'physical' human, but a genuinely alternative realm for cyborg consciousness as extensions of the Ideal with which engagement is possible. Beyond the concrete tyranny of the primacy of physical Existence, and in a critical interaction with the codes of digital Meaning, we are moving towards a truly cybernetic form of subjectivity and one of the key roles of digital culture is to create and insert into collective consciousness new methods of thinking subjectivity within such a shift. We are being confronted with the disappearance of individual mind-independent realities, creating new questions of how we might engage with the assemblage of a subjective mode of reality.

The question of engagement has become of great importance to the contemporary subject, and in particular to the relation between digital artist and spectator. Manovich has warned us that “new media, more often than not, turn the subject into a user” (2001, 205), and digital art has acknowledged the need to move beyond the passivity that threatens both art and technology. Benayoun has identified that, in the proliferation of ‘interactive’ works of art, “the spectator becomes a visitor experiencing the symbolic universe” (2008). The problem remains how to construct such a situation, both practically in terms of ensuring that the advancing technologies available are adaptable to the artistic purposes of forcing a questioning of perception, and also culturally or cognitively in redefining the parameters of how ‘spectator’ is conceived. Neal Stephenson comments on the problematic persistence of humanity within an audience, even taken to its absurd conclusion through digital technology:

We have not yet been able to create a digital audience. If you were talking to a digital audience, and noticed that they had, in the last few moments, become hopelessly confused, you could just hit Undo a few times and restore them to their previous state of mental clarity. Terminally confused audiences could be dragged to the Trash and replaced with fresh ones. (Stephenson 2001)

He is suggesting a confrontation between the digital medium and its potential for rewriting how the audience is conceived and constructed. However, it is not sufficient to relocate contemporary subjects into the digital world. This error has plagued digital utopianism such as John Perry Barlow’s ‘Declaration of the Independence of Cyberspace’, which claims that “we will create a civilization of the Mind in Cyberspace. May it be more humane and fair than the world your governments have made before” (1996). There is an inherent contradiction in the claim of a forthcoming purely digital consciousness alongside a desire for the essence of ‘humanity’. Stephenson’s absurdity reveals what Barlow refuses to acknowledge, the necessarily interwoven parallax of physical and digital consciousness for a critique of contemporary society and subjectivity. Such a critique cannot occur only in one domain, but must act upon consciousness itself as it engages with both worlds. Only by taking into account such a split reality of the cyborg subject can a distance towards either one take place. That is, only through engaged spectatorship can the subject temporarily disengage, to view its own perspectival position of parallax between the two realms as defined by the self-mediation of its own consciousness.

1.6 CONCLUSION

The apparent paradox of an engaged critical distance towards the self-mediation of the subject is the true stake in our understanding of cybernetic consciousness. This understanding

is the task of a digital philosophy, and creating a space of critical experience through which such understanding emerges is the task of digital culture. This chapter has demonstrated that not only must a rupture be created within the perpetual Virtual processes that form the illusion of a substantial subject, but a new emergent space must emerge from and within such a rupture that continues to exist without being subsumed into the subjective assemblage. This process of forming ruptures in the smooth functioning of the subject is expressed in Deleuze and Guattari's nomadology, which can be readily applied to digital culture, converting technologies from productive tools to disruptive weapons against the fixing of cultural, social and cognitive territories. There is a tendency, within the structures of consciousness that perpetuate the self-mediation of the human mind, to return to Virtuality and conceal the inversion of Existence and Meaning between realities. To deterritorialise these inversions, a critical culture must reveal and maintain the antagonism of parallax in order for the minimal distance to be sustained and communicated. Heisenberg identified this problem in established modes of thinking against quantum physics. Such rejections "would prefer to come back to the idea of an objective real world whose smallest parts exist objectively in the same sense as stones or trees exist, independently of whether or not we observe them" (2000, 83). This insistence on conventional thinking is, to Heisenberg, impossible, just as the ruptured subject that perceives the parallax position underpinning its conception of reality cannot return unaltered to the physical assemblage. Quantum mechanics must be included in the progression of a philosophy of science and so too must the digital realm be included in a philosophy of the contemporary subject, an integral factor in twenty-first century collective and cultural consciousness. The task, then, is to insert a minimal difference into subjective reality in such a way that consciousness becomes aware of its own self-mediation and thus re-mediate its return to 'reality' in a new, emergent, critically engaged and open assemblage of cybernetic subjectivity.

2 THE EMPTY SUBJECT VOID-IN-ITSELF IN ART

This chapter explores the nature of the subject in itself at the heart of the parallax of worlds, the void of the perspectival position. In approaching the subject as this void, the poststructural decentred subject must be developed from a constant displacement *between* symbolic realms towards a desubstantialised subject existing *in* neither physical nor digital worlds. This is the 'nowhere' of the subject amidst Virtuality of consciousness. The passage from void to Virtual reveals the problematic relation of the subject to itself and the impossibility of representing the inaccessible core of humanity, delineated in Žižek's terms of lack and excess between the Real, as the objectification of the void, and the Virtual, as the desire for the continued functioning of the subject. This uses Rancière's notion of the unrepresentable as a necessary condition for representation, transferred from (political) visual regimes to the ontological realm of consciousness in the cyborg subject. The Virtual surface of consciousness is explicated from Deleuze and Guattari's Body without Organs (BwO), developed through Žižek's critique of this concept and the inclusion of the void within the surface of consciousness as the Real, to suggest a 'Body without Organs without Bodies'. The placing of the BwO itself as a lost object of desire, the Virtuality of consciousness, reveals the impossibility of mapping consciousness as a whole, explored through the problematic mapping of digital symbolic spaces as relational flows around the subject.

The emergence of this surface from the void is further explored in terms of the abstract notion of the vacuum in quantum physics, along with a consideration of various forms of invisible particles that make up such spaces. This substance of the void is interrogated as a field of emergent immaterial forces, such as the dark energy necessary for the universe to form, returning always to the impossibility of viewing such forces directly despite their causal relation to the formation of worlds within consciousness. These inaccessible forces are discussed in the context of creative practices and a detailed study of the work of Pascal Dombis, who makes a direct and explicit confrontation with excess and irrationality in the gap within contemporary subjectivity, making clear the impossibility of representing the void and bringing the processes of parallax into view. Thus in answering how consciousness forms a subject from the void of parallax between worlds, the impossibility of beholding the void directly is shifted into a critical confrontation with the processes of Virtuality that make the void necessarily inaccessible to consciousness.

2.1 NOT DECENTRED BUT DESUBSTANTIALISED

In discussing the notion of the parallax subject as the gap between physical and digital worlds, the emergence of the subject and its constitution as gap must be interrogated. Žižek tells us that the subject “‘is’ a non-substantial void...the empty Nothingness of pure self-relating” (2007, 124). If the subject is nothing but a void from and around which consciousness posits itself, we must question the nature of this void. Žižek highlights the fact that “cyberspace phenomena render palpable in our everyday existence the deconstructionist ‘decentred subject’” (2006, 99), removing the distance of the illusion of centring and requiring a critical understanding of a new type. For Žižek, however, the subject is not simply located elsewhere but nowhere, or rather, there is no substance of the subject to be located anywhere. The nature of this void of the subject is integral to our understanding of consciousness and how it emerges, for the void refers here to what is commonly termed the unconscious. The antagonism between consciousness and the unconscious determines not only how both are brought into being, but the entire function of parallax. This is one of the fundamental dilemmas of psychoanalysis, the shift into or creation of the human as a ‘subject’, the emergence of consciousness from the unconscious that separates human reason from the instinctual behaviour of animals. Here we must confront the Lacanian problem of the “‘beginning of the world’...the passage from the pre-symbolic chaos of the Real to the universe of *logos*” (Žižek 2007, 7). If our understanding of the universe is always from an impenetrable position of parallax, in which we cannot observe the point of our own perspective it is because the position of our subjectivity is the void. The ‘stain’ in the gaze that forms the function of parallax and allows us a speculative glimpse at the nature of this process is the subjective void itself, a desubstantialised position from which the entire universe is brought into cognition and reality. Thus within the appearance of substance is no hidden truth or a trail outwards to a subject that is merely dislocated, but rather “the subject is interior to substance precisely as its constitutive gap; it *is* the void” (Žižek 2006, 40). The construction of the subject emerges from nothing, around nothing, and remains *in-itself* nothing. Against, or beyond, the poststructural trend of viewing the subject as decentred, we must insist on a view of the subject as desubstantialised.

In terms of the digital realm, where the familiar functions of consciousness can be inverted, a realm of fiction and fantasy where Meaning precedes Existence and the interplay of the Real and the Virtual can be staged, reconceiving the subject as desubstantialised

provides a major point of clarity in our understanding of our relation to any given world. Focusing on decentring implies that the subject is wholly shifted from one realm to the other, from the symbolic system and social/physical realities to the logic of computer code and the fleeting images of digital reality. Although such an approach suggests the constant relocation of the subject between worlds, it can be reduced to the suggestion that the subject simply exists in an alternative symbolic space to the one in which it perceives itself. The key point of a parallax reality is that the subject does not exist in any of the symbolic spaces in which it might be engaged, whereby “an individual is paradoxically more present as subject in the traces he leaves about himself than in his full presence” (Vighi 2012, 104). Desubstantialisation brings to the fore the functional nature of the subject as a machinic array of processes in the ever self-positing emergence of consciousness. The relations of consciousness to physical and digital worlds must be approached outside of substance, in order to gain an understanding of the nature of the void of subjectivity.

2.1.1 ONE OR MANY GAPS?

In its most reduced form, the question of the nature of the subject-void entails a question of whether all subjects are formed of one singular void or whether a distinct void exists for each individual consciousness. However, the differentiation of the void into one or more subjects is less a matter of the substance of the void, although this is a consistent concern throughout this chapter, than a matter of the differentiation itself. Žižek tells us that “consciousness arises from the primordial act which separates present-actual consciousness from the spectral, shadowy realm of the unconscious” (2007, 33) but also that the unconscious itself is “the highest deed of my self-positing” (*Ibid.*, 34). That is, the subject, as the functions of consciousness, emerges in the act of separating itself from the void. By positing something rather than nothing the void is separated and defined as the contents of either a single subject, a group of subjects or indeed as a collective subjectivity. This gesture of distinction is the symbolic passage from the chaotic Real to a world that humans can comprehend. Žižek marks this shift as a differentiation between the Thing (*das Ding*) and the *objet petit a* as two forms of the void: “*das Ding* is the absolute void, the lethal abyss which swallows the subject; while *objet petit a* designates that which remains of the Thing after it has undergone the process of symbolization” (2008a, 105). The Thing is the primordial horror of the abyss of subjectivity, the void-core of humanity that underlies subjective reality. The *objet a*, however, is the function of the Real within consciousness, the objectification of this void. Thus the void is neither singular nor multiple, for the notion of the void escapes classification as any form of countable substance, and is rather the unknowability as such of the subject to itself. This void,

although it constitutes the very 'substance' (or de-substance) of the subject, remains always inaccessible to consciousness. Žižek labels this fundamental level of the self the "void that is nothing in itself...which nonetheless serves as the unrepresentable point of reference" (2006, 102). From this desubstantialised reference point of subjective parallax, however, the Real forms the void as it is knowable to consciousness, as a function within thought. Here the role of the *objet a* becomes clear: in its most basic form it is the lack of substance of the subject itself and the lost cause of desire that instigates the necessary illusion of substantiality of the subject in our everyday perceptions. The formation and smooth running of the subject necessitates this objectified void brought into the functioning of consciousness in a way that remains elusive but is not entirely inaccessible.

Thus the question of one or many voids is not between subjects but within the subject itself. The void as such remains unknown and chaotic, while the void that forms the Real is the functional pull towards the void that keeps the Virtuality of self-positing consciousness from a constant flight into pure abstraction (or insanity). The need for substance is the quasi-causal relation that enables and inspires human subjects to construct itself through symbolic traces, and the presence of this rupture of the void as lost within any world we engage with allows for a critical confrontation of the self-perpetuating illusion of Virtual consciousness. In this sense, the void is not to be conceived as a morbid force, even though the Real is often associated with the death drive, but rather as an affirming negation that creates a space in which the antagonism of parallax can be sustained and a minimal (critical) distance towards it achieved. As Fabio Vighi illustrates, "the subject qua abstract negativity can only apprehend itself through an "objective correlative" of such negativity – the very "stuff" of which *objet a* is made" (2012, 104), and it is here that we insert a conscious mark or 'stain' in the smooth experience of subjective reality: contact with the void and its 'materialisation' as *objet a* through expression. This separation of the unrepresentable void and a representable-as-lost form in the Real is the integral function of the void in the structures of signification that support the entire process of our construction of reality within consciousness. Rancière states:

Some things are unrepresentable as a function of the conditions to which a subject of representation must submit if it is to be part of a determinate regime of art, a specific regime of the relations between exhibition and signification. (Rancière 2007, 136)

It is here the act of distinction itself that is necessary. There must be some element that cannot be representable in order for representation to occur, just as in our formation of reality there must be the inaccessible void in order for an accessible form of reality to appear to consciousness and in which a conscious subject can engage. As Žižek insists, "'atoms' are nothing but configurations of the void" (2009c, 148), and it is this antagonistic relation

between the void and any structure of reality that creates the parallax of the subject and through which we can approach the formation of the subject from the functions of consciousness, inserting a critical intervention between the subject *of* void (the objectified Real as void-function) and the subject *as* void (the desubstantialised position of parallax).

2.2 BODIES WITHOUT ORGANS WITHOUT BODIES

2.2.1 THE SURFACE OF CONSCIOUSNESS

Žižek's notion that "the subject "is" only the activity of its own self-positing...a purely virtual entity" (2012, 61) informs a Deleuzian construction of the subject as a surface. The desiring-machine of the Virtual function of consciousness is the process of this self-positing: a gesture of demarcation that separates from the void a space of subjectivity. While this does not create a substance of the subject, for desire is never achieved but rather acts as the process of desiring and producing desire itself, it enables subjective reality to form within consciousness. Deleuze and Guattari write that "desiring-machines work only when they break down, and by continually breaking down" (2004a, 9), and it is the constant failure of producing a subject from the void that insists on the demarcation. This bordering creates a surface, which is the Body without Organs (BwO), the fundamental process of desiring the formation of subjectivity itself. Deleuze and Guattari define the BwO as "desire; it is that which one desires and by which one desires" (2004b, 183) and which is "perpetually reinserted into the process of production" (2004a, 9). The Virtual function of consciousness, which is this desiring-machine, thus opens a crack in the void that forms a shell, a surface on which the subject can occur. Where Deleuze and Guattari view desiring-machines as organs, by placing them here as self-positing functions in the Virtuality of consciousness the antagonism between desiring-machines and the BwO is precisely what sustains the constant re-positing of the surface of the subject. As subjective expression, this gesture necessitates a constant engagement, desiring the creation of a space in which it can appear.

This is exemplified in Christa Sommerer and Laruence Mignonneau's *Excavate* (2012b) where an engaged spectatorship is necessary to view the surface of the work. The viewer carries an antique magic lantern into a cold war military shelter, projecting light disrupted by dark particles onto various parts of the walls. As the spectator lingers in one place these particles form into isopods and eventually into the scared faces of children. There is no

explanation of why these images have appeared onto the surface of the dark, wet and humid cave. It is the presence of the engaged spectator with their mediating apparatus that brings forth the active surface of a Virtual world atop the apparent physical space. The Virtuality of the spectator creates the desire for the work, which emerges through an engagement with the mediating processes as a pure visual surface that will disappear again when the subject moves away. There is here the antagonism between the work as a complete surface of the BwO and the 'organs' of the spectator, lantern/projector and individual elements of the projection. These individual elements, however, act beyond the simple role of organs, functioning as affective objects which "determine a zone of intensity as an imprint or zone on a BwO" (Deleuze and Guattari 2004b, 173). Through these zones of intensity – the inherent antagonism and fragmentation of desire that always fails to display the whole visual field – the work constructs a shifting surface on and as which a BwO appears as a presupposed entity. This is furthered in the work *Wissengewächs* (Mignonneau and Sommerer 2007), which inverts the relation by creating an interactive façade on a 'greenhouse' containing a science exchange library. The screens form part of this surface of glass that contains knowledge. The title, translated as 'growth of knowledge' emerges as sensors convert the presence of spectators into the growth of a digital garden on the screens. If the work itself is viewed as expressing the subject, then the Otherness of the spectators is a necessary force in the desire



Fig.9 Wissensgewächs

© 2007, Christa Sommerer & Laurent Mignonneau

Interactive media façade developed for the City of Science, Braunschweig

The presence of spectators influences the growth of the digital garden around a science exchange library.

of the work to grow and create images and movement on the transparent glass surface that contains consciousness as the potential knowledge obtainable by the public through entering the space. In relation to the void, the BwO as desire is here the formation of a subject as Other to the void; the creation of a reality of something outside of the internal nothing. In this manner it forms as difference, of the subject to itself and the inclusion of the imaginary big Other as the Virtual function of consciousness.

What is this surface on, through and as which the subject emerges? What lies beneath? Deleuze writes that “there is nothing behind the curtain except unnameable mixtures, nothing above the carpet except the empty sky” (2004b, 150). To engage with this depthless surface requires an act of perversion as the “extraordinary art of surfaces” (*Ibid.*, 151). Furthermore, after designating the artist as both patient and doctor of civilisation in relation to its critique, Deleuze states that in a genuine approach to analysis of subjectivity, “the artist is not only the patient and doctor of civilization, but is also its pervert” (*Ibid.*, 274). Here there is an intrinsic role of creative activity in the negotiation of the surface of the subject, as demonstrated in Ralf Baecker’s *The Conversation* (2009). This work, constructed as a ring of 99 sensor-actuator pairs autonomously maintaining the tension of three rubber bands, displays the notion of the BwO as a surface created and sustained by organs-as-functions. Beyond the allegorical surface around a void created by the rubber band structure that recalls the visual imagery of a strange attractor, the work, part of a practice described as “proto-computational - where artists seem to be stripping digital computing down to its raw materials, only to rebuild it as



Fig.10 The Conversation (2009) © Ralf Baecker
A ring of sensor-actuators autonomously maintain the tension of the three bands that form a surface around a void in the centre of the device.

something weirder" (Whitelaw 2013), suggests the role of desiring-machines as forces rather than objects. The individual functions desire balance, the creation of a stable subject, while the subject itself, in the rubber bands, mediates these desiring-machines as a surface on which the forces can be made manifest.

The artist writes that the work "incorporates an analogous and a digital part. These almost inseparable elements try to adapt to each other. As the process does not have a linear program it is not obvious which part controls whom" (Baecker 2009). The disruption of causality in this self-referential cybernetic activity displays the relation of self-positing Virtual consciousness to its surface as the BwO. After setting up the array and the initial states of the bands, what we might label the objectification of the void as the quasi-causal Real function of consciousness, the only engagement by the artist is turning on the machine, inserting the fundamental gesture of a desiring-subject, of minimal difference, of something rather than nothing. In answering the question 'how do you make yourself a body without organs', Deleuze and Guattari explain:

At any rate, you have one (or several). It's not so much that it pre-exists or comes ready-made, although in certain respects it is pre-existent...an inevitable exercise or experimentation, already accomplished the moment you undertake it, unaccomplished as long as you don't...You never reach the Body without Organs, you can't reach it, you are forever attaining it, it is a limit. (Deleuze and Guattari 2004b, 166)

What they are describing is here the function of the Virtual in its fundamental role as the desire of consciousness to produce itself, seen in Baecker's work as forces structuring an apparently premade surface maintained only through the constant processes of desire that require it and posit it as presupposed. The BwO thus acts as an attractor, a Virtual surface displaying the function of consciousness as such, drawing together the other functions through the designation of a difference separating the subject from its void. Baecker "considers computers and cybernetic machines as epistemological hardware rather than tools" (2013), and the relation of the BwO as a surface of the subject across digital and physical planes suggests the role of cyborg consciousness also as 'epistemological hardware': a Virtuality enabling knowledge of the surface of the subject as self-positing only through the process of desiring-subjectivity.

2.2.2 HYPER-CARTOGRAPHY

Knowledge of the surface of subjectivity, the actualisation of a BwO that can make contact with Otherness (the positing of the Virtual big Other as the prerequisite for Otherness as such), risks a codifying of consciousness in the desiring-machine of excessively self-cognising Virtuality. As soon as there is a surface, there is a cognitive landscape, and in our epistemic

quest across this surface a schema of functions can appear as objectifications of the subject. The completeness of the BwO, is what Deleuze calls the “good object...by nature a lost object. It only shows itself and appears from the start as already lost, as *having been lost*” (2004b, 218). Here we see the antagonism between the void and the surface, for the void is only acknowledged as void when it is lost beneath the surface of the subject, and in so doing the surface itself appears lacking in its inclusion of the void as the Real function of consciousness. The perpetual desire of the Virtual, in the interplay of Existence and Meaning, enacts a coding of cognitive space that overly territorialises the subject to appear as a static image rather than as the constant processes of functions. The nature of this coding in the processes of consciousness is where the ‘perversion’ of artistic creation must interject through thought, rupturing the self-referential loop of Virtuality constructing the fantasy of a substantial subject concealing the functions of consciousness and creating the appearance of a static reality of organs and (partial) objects. How, then, might we construct a knowledge of the surface without losing sight of the processes at work? Deleuze and Guattari warn us of “the logic of tracing and reproduction” (2004b, 13), an inherent risk of the self-perpetuating Virtuality of consciousness whereby the need for desiring-machines to produce themselves simply traces and retraces the codifications of consciousness without a space for critical interrogation of the void. Deleuze and Guattari instead instruct us to “make a map, not a tracing...The map does not reproduce an unconscious closed in upon itself; it constructs the unconscious. It fosters connections between fields...The map is open and connectable in all of its dimensions” (*ibid.*). In the demarcation of the void through the Virtual function of consciousness, this suggests a broadening of codification beyond merely self-duplication and into a cartographic practice as an integral part of the very construction of the individual subject as consciousness constantly maps and re-maps the reality of its own unconscious Real.

This is a problem of the representation of non-physical spaces, such as the digital realm, and of consciousness. The self-negating effect of embodying and mapping data reverts to the logic of tracing in its attempts to plot non-geographical spaces such as the internet. Alexander Galloway (2011) draws on Rancière’s notion of the unrepresentable (2007) regarding attempts at visualising data: “data have no necessary visual form...any data visualization is first and foremost a visualization *of the conversion rules themselves*...the artifice is more evident than anything else” (Galloway 2011, 88). Here manifests the antagonism between the Virtual surface and the depth of the void. The Real of data forms the unrepresentable as the necessary predicate for the Virtuality of consciousness. The underlying void remains inaccessible and detached from the surface, and we can only acknowledge the unrepresentability of the void through its objectification as the always-already lost Real.

Galloway furthers this notion by separating information from data; here this is separating Meaning from the Real in the digital, and the subsequent problems of mapping the inexpressible of data. In contrast to unrepresentable data, in the regime of information:

Every map of the internet looks the same...All operate within a single uniform set of aesthetic codes. The size of the aesthetic space is one...A single symbolic code reigns, iterated universally. And where there is only one, there is nothing. For a representation of the one is, in fact, a representation of nothing. (Galloway 2011, 90)

This impossibility of mapping the internet, and the fluidity of digital communication in general, stems from the “hub-and-spoke aesthetic” (*Ibid.*) that dominates such visualisation. Even when maps avoid the literal visual reference of spider webs, such as Ruslan Enikeev’s *Internet Map* (2012)⁴ that displays the size of internet domains as circles placed in proximity to their most commonly linked counterparts, the relations between objects appear secondary to the nodal view of static sites. In this visualisation of partial objects, separated by symbolic space, there appear Deleuze and Guattari’s ‘organs’, each with their own alienated identity. The constant process of desire constructs a binary procedure of production from an apparently singular root or genesis that can achieve diversity only by splitting into branches of an ‘arborescent’ mode of codification. But Deleuze and Guattari insist that “thought is not arborescent, and the brain is not a rooted or ramified matter” (2004b, 17), and our consciousness emerges as all functions, self-posed as presupposed, *simultaneously*. This rhizomatic approach to the surface necessitates a map that avoids the rigidity of identifying partial objects, focusing instead on the relations of forces within the Virtuality of the BwO. In constructing a diagram, described by Deleuze as “a map, or rather several superimposed maps” (2006a, 37), Ronald Bogue emphasises a “cartography of desire that charts the fissures and rifts of metamorphoses and becoming” (2004, 41). In both consciousness and the digital there is the need for a level of ‘hyper-mapping’ outside of physical conceptions of space.

This moves against the maps produced by research groups such as the Oxford Internet Institute, which focus on limited visual representations tracing digital activity onto geographical ‘maps’ of the physical world.⁵ Negroponte states that “the digital world is intrinsically scalable” (1996, 43), seen in modes of hyper-mapping that extend beyond our familiar codes of physical space-time. Tools such as Google Maps allow for a mapping that augments the territory by overlaying hyperlinks to semantically related data, and even places the map within the territory through Street View and user-generated content. Conversely, apps such as GoogleGoggles augment the location itself with hypertextual mapping drawn

⁴ See <http://internet-map.net/>.

⁵ See <http://geography.oii.ox.ac.uk/> for a range of such maps as a representational tracing of data rather than a true cartography of the digital.

from images scanned *in situ*. These technologies draw the subject simultaneously into both the territory and the ever expanding map. The same cartographies are needed for the scalability of consciousness, whereby the BwO that constitutes the Virtual surface of the subject exists at a scale encompassing all aspects of subjective reality, reconstituting itself into a new assemblage with each new form of reality that takes into account all the relations and forces of the functioning of consciousness. The subject is not a fixed entity but a constant reproduction in the Virtual, and the surface emerges only as a series of interconnected functions. Land states that "the connections that are made and the flows that produce these circuits trace out the full range of possible, or rather 'virtual', connections and circuits whose totality comprises the body-without-organs" (Land 2005, 29), and this necessitates not only a map of fluid spaces but a map that is fluid itself, for the territories of the subject are themselves ever shifting into new assemblages and new BwOs.

Deleuze and Guattari's nomadic approach to subjectivity, worlds and culture follows through to their cartography, as an artistic intervention that constantly deterritorialises the representation of space through hypertextual gestures of a constant and creative remapping. Sommerer and Mignonneau's *Escape* (2012a) inserts such a visual mapping into a seemingly fixed space, with their intentional depiction of a failed "flight attempt" that displaces its subject into an internal flight of symbolic transformation (Mignonneau and Sommerer 2012). An antique projector displays what appears to be a fly on the screen. Turning the handle of the machine makes the fly move frantically, as if attempting to escape, before multiplying into a swarm and eventually transmuting into text from Kafka's *The Metamorphosis*, specifically the moment when Gregor Samsa becomes aware of his transformation. Here the need for escape, for a 'line of flight', is taken first literally by the fly and then as an insistence on the transformation of the subject. The metamorphosis escapes the surface of the space as BwO, the human physical body of the character and the visual image of the fly, unleashing the horror beneath the structures of desire that support the illusion of a fixed substantial subject. This line of flight changes the very terms of the map, from human to something Other, reconfiguring the Virtual surface of the subject as a space on which and by which a transformation of consciousness can occur. The engagement of the spectator in *Escape*, as with the necessary critical engagement of consciousness, places the hyper-cartographic intervention beyond a visual map or even a cognitive map but into an experiential map through which a shift in the parallax can make visible the Real as an objectification of the void.

2.2.3 THE FLOW OF VIRTUAL AND REAL



Fig.11 The Living Web
©2002, Christa Sommerer, Laurent Mignonneau & Roberto Lopez-Gulliver
Interacting with a complex 3D data environment at the Art-of-Immersion Festival Bonn

Žižek identifies the seemingly inseparable parallax relation between Deleuzian desire, as the BwO free of partiality and lack, and his own Lacanian drive as an OwB (Organs without Bodies), in which the lacking objects themselves constitute the fragmented parts of the subject (Žižek 2012, xii). Here a relation of function must be discerned to sustain the antagonism and thus inject a space within our parallax position regarding the Virtual (desire, BwO) and the Real (drive, OwB). The Real here exists within flux, when freed from the hierarchies of the organism that consciousness often seeks to codify and stratify, while the Virtual is the process of flux that ensures the continued functioning of consciousness. The relation of these functions to consciousness, and the creation of a subject around the void, manifests in cybernetic flows. It is both desire and drive, the Virtual and the Real, the BwO and the OwB, that are necessary to create the cyborg subject and spaces for a critical distance towards it. Sommerer and Mignonneau's *The Living Web* (2002) creates such a space in relation to digital consciousness, with an immersive web browser placing a vast array of digital entities on the surface of a CAVE installation, streaming material according to spectators' conversations fed through speech recognition software and internet searches. The aim for an

intuitive experience of the digital space suggests an attempt for a direct creation of media from the Virtuality of consciousness, where the mediation appears only as a smooth surface of information made manifest. The individual objects, each of which is considered 'lost' in terms of the individuated digital space it represents within the bombardment of visual and sonic data, create a space within the formation of the surface. In this parallax gap, the Virtual flow can escape towards the flow of the Real, as consciousness attempts to reach through the surface of mediation towards the objects and information it desires. These flows, what Brian Massumi describes as a network of displaced agency whose unconscious is the human subject (2002a, 130-1), are further expressed in *Mobile Feelings* (2003), which has been described as a work "engaged in the switching of sensations and percepts between users" (Ross 2010). The creation of mediating 'organs' through which sensual data is shared wirelessly across a gallery space highlights the role of the Other in relation to Virtual flow. These partial objects that enable a line of flight create a space within the surface of the subject through which the



Fig.12 Mobile Feelings

© 2003, Christa Sommerer & Laurent Mignonneau

Supported by France Telecom Studio Creatif, Paris and IAMAS Gifu, Japan

Two heartbeat and breath communication devices housed in gourds

These devices host miniature bio-sensors and actuators that capture the users' heartbeat, blood volume pressure and pulse, skin conductivity, sweat and smell. All data can be sent to other anonymous users who can perceive and feel these most private sensations through actuators, vibrators, ventilators, micro-electromechanical and micro-bio-electrochemical systems which are also embedded in each "Mobile Feelings" device. (Mignonneau and Sommerer 2003)

experience of an Other can inform our own consciousness. Here we are reaching a Body without Organs without Bodies (BwOwB): the surface of consciousness in which the void is objectified as lost, but under which the entire assemblage itself is lost. This is an interjection of the Real as a space within the surface of Virtual consciousness through which a rupture of minimal difference can negotiate a brief relation to the void. Such critical interventions of the Real amidst the flow of the Virtual, parallax perturbations in the surface of the BwOwB, are the necessary process by, on and through which the void is separated in the fundamental minimal difference of parallax and might be glimpsed as an objectification of the Real in art.

2.3 A-PARTICLE PHYSICS

2.3.1 VACUUM

The task remains to interrogate the nature of this void that is objectified into the Real. The process of confronting the unnameable, unrepresentable void is speculatively negotiated in Mignonneau and Sommerer's *Life Writer* (2006), in which entering words on a typewriter causes letters projected onto the paper to shift and morph into bug-like creatures. The creation of the creatures is governed by the coding of an artificial genetics derived from the characters entered by the engaged spectator. The work creates, in exposing the Real beneath symbolic and genetic codes, a consciousness of the necessary void – between physical and digital, linguistic and biological worlds – that defines the work. Staging the reverse operation of *Escape* – here the shift is from symbolically to genetically coded objects – this process, whereby the symbolic particles spring to life across such a void in their engagement with the spectator, echoes the creation of virtual particles by vacuum fluctuation. The emergence and disappearance of particles from the void of a vacuum space is the functioning of Virtual consciousness through which the void might be objectified into 'particles' as the Real. It is the concept of a vacuum that provides the closest approximation of the inaccessible void. Quantum physics has revealed the non-emptiness of a vacuum, instead pointing towards a lowest possible state of energy in which electric and magnetic fields "are uncertain and may be seen as fluctuating about mean values...[the] field has zero mean value but is not identically zero" (Craig and Thirunamachandran 1984, 40). This abstract nature of a perfect vacuum, in which no matter or energy exists, draws further parallels with the appearance of the void of subjectivity only within a conceptual allegory. The truly empty remains always

inaccessible, yet is an essential element in the construction of a space in which the subject can exist.



Life Writer ©2006, Christa Sommerer & Laurent Mignonneau

Fig.13 Life Writer

© 2006, Laurent Mignonneau & Christa Sommerer

Typing generates letters which transform from symbolic to genetic code as bugs moving across the paper.

Tegmark describes the 'anthropic principle' as an obligatory function in quantum mechanics (in Carr 2007, 108), the role of the observer or engaged spectator that we call subject as a "self-aware substructure" in the "mathematical democracy" of selecting the conditions for a universe in which it can exist (*Ibid.*, 118). Jonathan Frazer and Andrew Liddle add that "anthropic arguments place an incredibly strong bound on the vacuum energy" (Frazer and Liddle 2011, 30), and it is through the limit that consciousness imposes on the vacuum, the surface that marks out the empty space that forms the subject, that we might

undertake an estimation of the nature of this void of subjectivity. This limit of consciousness at the edge of the anthropic principle is demonstrated in Maurizio Bolognini's *Sealed: Programmed Machines* (1992). Described as a key development in software art (Broeckmann 2006), the work consists of a collection of computers, set to generate images according to Bolognini's programming, with sealed monitor bus ports. The complete inaccessibility of the vast quantity of visual imagery created by the work references a technological sublimity of the void beneath the digital world. Meanwhile Bolognini's intervention at the programming level, perhaps the only point at which the work could be said to be 'viewed', mirrors the role of the conscious observer in the anthropic principle, defining the fundamental laws of the universe as presupposed. In this split of control and inaccessibility, the engaged spectator can only be the artist himself, constructing the 'universe' of his work within a perceptual vacuum that creates a subjective void: "between the real and illusory dimensions of a more or less forced virtuality" (Madesani in Solimano 2005, 56). This creation of an inaccessible space between Real and Virtual displays the self-positing nature of Virtuality from the void, and a potential arena for reframing the emptiness of the subject.

Bolognini's position "at the crossroads of conceptual art and generative art" (Bolognini 2012) can be associated with the post-conceptual practice Peter Osborne identifies as "the fictional 'presentness' of the contemporary" (2010, 5) favouring presentation over representation in "the interpretation of what is through the construction of new wholes out of its fragments and modalities of existence" (*Ibid.*, 8). Rancière's notion of unrepresentability (2007) appears again in the necessary and affirmative conditions of representation, described by Galloway as "less a question of the failures of representation on its own terms and more a question of the historical shift out of one regime into a subsequent regime" (2011, 92). This shift towards presenting rather than representing the unrepresentable draws into art theory the shift that has occurred in quantum physics, the same shift that this thesis suggests in relation to consciousness: the necessity of an impenetrable void in order for the appearance of substance (as image, world, or consciousness in the formation of the subject). For Galloway and Rancière, for Bolognini, and for understanding the vacuum of quantum mechanics, the process by which we can speculatively engage with the unrepresentable and inaccessible void is the creation of a limit, staging a similar conceptual space against which the antagonism of denied direct engagement forces the spectator to examine the relation of the surface of the work and of their own parallax position to what might lie beneath.

This return to a surface through which to view the void, the split within the structures of the perceptual BwO, is manifested in Mignonneau and Sommerer's *Nanoscape* (2002). This work creates an invisible nano-scale landscape, accessible only through the specific interface

of a magnetic ring through which the spectator 'touches' the work. The placing of the work as an unrepresentable entity, accessible only through a perceptual flux of forces, displaces any engagement with the installation into the Virtual realm of consciousness, what Ascott identifies as the work's anti-materialist gesture in constructing "the plane on which technology and consciousness can meet" in the nano as "a point of access to the complexity of immaterial, subatomic domains" (2005). The aim for "an intuitive experience where users can interact with invisible self-organizing atoms" (Mignonneau and Sommerer 2005, 200) pushes the negotiation of the work into the cognitive realm, as the spectator must create the landscape of the work in the imagination as part of their own surface of consciousness. This crosses the post-conceptual divide of Bolognini's *Sealed* devices, as the spectator here can engage with the work, albeit indirectly. The position of the artists as Tegmark's self-aware substructure follows Bolognini's role in determining the fundamental laws of the work. However, the placement of the inaccessible within the consciousness of the individual spectator, rather than locked inside the physical objects of the work, moves across a conceptual impact into a cognitive disruption of the subject, allowing for an intrusion of the void of quantum forces into the surface of subjective reality. This follows the cosmological impact of quantum mechanics, in the effect of fundamental particles on the formation of the universe. Anthony Aguirre and Tegmark explain that "the post-inflationary properties are then primarily determined not by cosmic initial conditions, but by the *dynamics* of inflation" (2011, 3). Similarly, the functioning of consciousness in the Virtuality of self-aware superstructure or self-positing engaged spectator here defines and perpetuates the dynamic of such an inflation. The formation of a reality in which the subject can engage is determined by the manner in which such a reality emerges as a surface from the void, and any access to the void can only be achieved through a critical intervention within the surface that disrupts the functioning dynamics and makes clear a rupture of the Real as objectification of the void.

2.3.2 NOTHING IN PARTICULAR

With a framework for modes of comprehending a conceptual un-representation of the void, it is possible to move towards a notion of what constitutes the desubstantial core of the subject. Examples from cosmology can illuminate this process, as they attempt to determine the formation of the universe and its contents from the traces left in the false vacuum of space. The Eridanus Supervoid, a dark spot in the CMB – the Cosmic Microwave Background, the earliest observable data described as "the most ancient image of the universe" (Cruz et al. 2008, 29) – offered one possible such explanation. There was speculation upon its discovery that this void could be the imprint of an interaction between universes (see, for a 'popular

science' discussion, Chown 2007), functioning as an objectification of our encounter with another realm and a potential model for our engagement with the void of subjectivity. However, more recent research suggests that the dark spot in the CMB is more likely a void in our observation, a creation of the process of measurement in the selection of parameters (Zhang and Huterer 2008). The void possesses no window to a 'deeper' level of consciousness, but is the necessary gap in the subject required in order to think ourselves as a subject. This aligns with Rancière and Galloway's notion of the unrepresentable, suggesting the need to examine what lies unseen within the universe, rather than what lies outside it. The internal rather than the external void must be our focus, for even cosmology must consider the impact of quantum scale developments in defining the fundamental laws of the universe.

This dilemma is staged in Yayoi Kusama's *Infinity Mirror Room – Filled with the Brilliance of Life* (2011 and 2012). Following a long practice of mirrored rooms to render finite perception of the work moot, these two embodiments of the project, including the largest one thus far in 2012 at the Tate Modern, London, add controlled colour-changing LED lights to the formerly analogue work. There is here a permeation of the physical space by the digital, contrasting with the light and saturated colours of the previous works, Kusama's practice becoming "more baroque as technology and money have allowed" (Searle 2012) to create "the experience of being in an apparently endless space, broken only by points of light in the darkness" (Taylor 2012). The construction of the space here functions in the manner of the digital world, with the illusory Virtual-Existence constructed as pure appearance within consciousness as the engaged spectator "disappear[s] among your own reflections" (Searle 2012). The experience of such work places the subject in a relation to the void of their own position, and the visual allegories at work evoke a cosmological representation of the infinite. Beyond the difficulty of documenting such mirrored spaces in photographs, the installations have been described as "the kind of work that cannot be tweeted" (Nussbaum 2013) in the complexity of the experience within a simple and nearly empty space and the failure of its representation. The engaged spectator is here left alone with their parallax position, constructing the infinite space as the substance of darkness. It is possible to draw here a conceptual parallel with dark matter, amidst an increasing trend in physics towards an unknowable realm of antimatter.

Kallenbach stresses that in the total density of the universe, "baryonic matter [which includes all atoms] only contributes a few percent! This suggests that other ("dark") forms of energy and matter exist" (in Figger, Meschede and Zimmermann 2002, 182). While it is possible to observe the gravitational effects of dark matter and the forces of dark energy, they remain experimentally unmeasurable, quantifiably absent and qualitatively mysterious. One unusual feature of dark energy is that it "can be seen as the opposite of gravity. While gravity

pulls matter together, dark energy is what is causing the universe to expand, and at an ever-increasing rate" (Kazan 2010), and it is this expansive character that defines Kusama's *Infinite Mirror Room*. Through the mirrored expansion of the perceptual field the universe of the work is perpetually increasing in size, not of the work itself through time but through the perception of it by an engaged spectator as more lights and more space is brought into the field of the gaze and into the surface of the subject. The lack of a limit, however, places this expansion beyond the Virtual into the dark void, at the centre of which stands the subject as parallax. The subtitle of the recent installations, *Filled with the Brilliance of Life*, suggests that between the LEDs is not merely empty space, but an ever-expanding fullness of dark energy. Indeed, the work has been described as possessing "a palpable energy and a sometimes malevolent intensity" (Searle 2012), for the effects of dark energy can not only be felt but infer potentially dangerous consequences. The speculated connection of dark matter and energy to the hypothetical 'primordial black holes' – "a black hole created in the very early universe" (Hawking 1988) – suggests both the perilous forces at stake and the role of such forces in the creation of the universe. This includes, counter to the conventional view of black holes absorbing all matter, the influence of quantum mechanical effects that create/emit particles (Hawking 1975, 199). The void of Kusama's installations, as with the dark matter void of a black hole and the cognitive parallax void of the subject, possesses a generative material outside of conventional conceptions of particles.

Atypical and unobservable particles occupy an increasingly important place in the discussions of contemporary physics, from the dark matter and energy constituting most of the universe to the asymmetry between matter and anti-matter in baryogenesis (the formation of protons and neutrons that constitute matter). Even beyond these familiar paradigms there is the radical 'unparticle' physics of Howard Georgi (2007b). This approach goes beyond the familiarity of viewing the universe in terms of particles, which the wave/particle duality shows as simply one manner of viewing what appears as pure energy, towards the elements of the universe that are inaccessible, yet "whose production might be detectable in missing energy and momentum distributions...virtual effects" (Georgi 2007a, 275). This Virtuality lying beyond the classically framed notion of the quantum world as individuated particles reveals the unparticle to the spectator only in its absence, its loss. Thus the dilemma of the Real reappears when that which is beyond particles emerges as an *objet a*, an objectification of the flux of the void, an *a*-particle. This unparticle, or here *a*-particle, physics is an attempt to conceive of scale invariance in massless entities: the substance of fields. The unparticle approach thus aims to visualise the "scale invariant stuff" (Georgi 2007b, 1) that fields are made of.

Scale invariance displays much in common with the logic of fractals, and indeed fractal self-similarity can be considered an example of scale invariance. Thus fractal art offers one method of viewing a conceptualisation of fields-as-particles, such as the work of Carlos Ginzburg, which explores “the fractalization of pictorial space and the artistic image” (Artcat 2010), providing a creative inclusion of the process of invariance itself within the objectified Real that can be achieved in art works. Fractal ‘objects’ are formed only from lines as fields or attractors, concerned with the “Age of Complexity” and its “physical and psychological landscapes” (Condé 2001). Ginzburg’s *Homo Fractalus* (1999) displays the psychological extrapolation of this use of scalable fields, showing a human form through fractal shapes, an objectification of the void bringing the forces of *a*-particles into the human subject. The fusion of object and field in the surfaces of Ginzburg’s works, embedded in a negotiation of the psychological construction of the human as a fractal subject, creates a negative cognitive space in which the forces of the void might be extrapolated. Engaged spectatorship of such work necessitates a viewing from afar as a shifting field on the smooth surface of the image, controlled by unseen forces, and a closer viewing in which the objectification of such forces is revealed as lines form into specific shapes and signifiers. Between these two views is an opportunity for a displaced perspective to emerge, for consciousness to view the fractal nature of its own construction and to speculate the nature of the unparticles of the void that create the lost objects of the Real with which the Virtuality of consciousness interacts. The difficulty of ‘coupling’ such unparticles to visible fields (Luo and Zhu 2008) remains a key factor in the appearance of phenomenological effects, for subjective reality forms according to its manner of appearance as a Virtuality of and to consciousness. Emergent processes of engagement are thus essential to a critical scaling of perception in art (Benjamin 2013), creating the opportunity for disruptions between the individual and the universe and within the perspectival position of the subject itself. Such a rupture in the surface of the work of art might force the engaged spectator between points of view in such a way as to reveal the parallax of forces that cause such framings of perception and consciousness.

2.3.3 THE LIMITS OF THOUGHT

These forces within consciousness that constitute the desubstantialised core of the subject can be brought into our knowledge only as an objectification in the Real, as a pulse in the flow of energy. David Albert (1992, 133) explains the epistemological void of the quantum realm and suggests that, apart from our apparent knowledge of any particular observation, the quantum state of the universe cannot be proven to be anything other than a vacuum state. This returns to the question of the emergence of the subject as a Virtual function or vacuum

fluctuation. Indeed, there are those who suggest that the entire history of our universe is one giant such fluctuation (Tryon 1973), an externalised echo of the formation of the subject as a pulse of Virtual consciousness in the Real of unobservable energy. The indeterminate origins of the universe and the similarly indeterminate genesis of the subject from the void display the fundamental gap within human consciousness: the inability to reconcile a space outside of the known with our engaged perspective of subjective reality. The inflation of the universe according to the fundamental properties, as defined by the anthropic principal, is explained in Tegmark's description of the limits of observation:

The farthest you can observe is the distance that light has been able to travel during the 14 billion years since the big-bang expansion began...a sphere of this radius defines our observable universe, also called our Hubble volume, our horizon volume or simply our universe. (Tegmark in Saunders et al. 2010, 2)

What he is describing here is the epistemological problem that Albert explains, and the failure of all theories of dark/anti-/un- particles to explain the emergence of the universe, just as art can only explain the unrepresentable by displaying and interrogating the limits of representation (Rancière 2007). Across science, art and philosophy we are looking at the failure of transcending the limit of our understanding at the unrepresentable point of reference necessary for all knowledge of worlds. If the void will always remain impenetrable, and if a genuine understanding of its properties – whether they be those of dark energy, anti-matter, unparticles or something entirely beyond our current comprehension – will remain impossible, the only task that remains is to bring into critical light the processes by which the void is concealed.

This necessity of critically representing the limits of perception in relation to the formation of physical and digital worlds is demonstrated in Baecker's *Irrational Computing* (2011). This work, consisting of five modules each utilising crystals and minerals to construct electro-mechanical signal processors, stems from Baecker's conception of computing as "a cultural and not a natural phenomenon...Generative utopia" (Baecker in Whitelaw 2013). The positioning of the computer across physical and digital worlds moves beyond the emergence of thought. Furthering the work of *The Conversation*, Baecker describes *Irrational Computing* as a series of "speculative machines...with a focus on the encounter of thought and the (physical) world" (2013), which attempt to develop "an other kind of thinking. A thinking that is anti "cause and reaction". A thinking of hidden relations, connections and uncertainty" (Baecker in Whitelaw 2013). This conceptualisation of the machinic functions that constitute how we conceive the world and the computer is also a construction of the subject Virtualised as a primitive 'computer'. The rupture in our conceptions of the computer and relation to it here places physical and digital reality as the result of an informational construct, whereby the

void of the subjective parallax is exposed as the process of designation against the unseen and unpredictable quantum physical processes that govern the crystal computer structures. Baecker describes the paradoxical manner in which “modern computer technology has thus tamed and domesticated the chaotic” (2011), bringing into view the Virtualising processes of our construction of digital consciousness. This crossing of physical and digital processes and modes of consciousness at the quantum level has been theorised as the ultimate formation of reality in Wheeler’s ‘it from bit’ hypothesis. Wheeler states that “information sits at the core of physics” (1998, 340) and that “reality arises in the last analysis from the posing of yes–no questions and the registering of equipment-evoked responses; in short, that all things physical are information-theoretic in origin and that this is a participatory universe” (Wheeler in Zurek 1990, 311). The implication of Wheeler’s suggestion – the essential similarity between (classical) physical, digital and quantum ontologies – is that the fundamental process defining reality is a basic binary choice. The ultimate ‘yes-no’ question is that of the formation of consciousness itself, the minimal difference from which the Virtuality can emerge. At the heart of creative critical digital culture, seen in works by Baecker, Sommerer and Mignonneau, or Dombis as we shall see below, is the representation of this designatory statement that brings about the entire universe as a Virtuality within consciousness. Such critical art is fundamentally approaching the very question that instigates the self-positing of the subject, the establishment of a parallax position and the separation of the void from consciousness.

2.4 PASCAL DOMBIS: IRRATIONAL SUBJECTIVITY

2.4.1 GEOMETRIC PERMUTATION

The primordial division of consciousness that establishes the minimal difference in which the surface of the subject can emerge from the void is a gesture of thought, rationality, logic and reason: a gesture of Virtuality. It is only within the framework of such Virtual cognitive forces that the BwO is able to form the subject in what Deleuze and Guattari describe as “that glacial reality where the alluvions, sedimentations, coagulations, foldings, and recoilings that compose an organism – and also a signification and a subject - occur” (2004b, 176). Beneath this shifting cartography that enables a territory of the subject to form and develop is the perpetual decision of consciousness to think itself. An artist who critically confronts this

notion is Pascal Dombis, whose “regime of post-virtual images” (Buci-Glucksmann 2012) aim towards a perpetual reconstruction of the relation between the subject and technology through a radicalisation of the processes of reason that define the Virtual structures of reality. If Deleuze “gives philosophical expression to a world of fractal and Reimannian [sic]⁶ geometries, quantum and chaotic physics, and a logic of pure relations and paradoxes” (Smith 2009, 41), then Dombis gives artistic expression to the same world, embedding within technology the processes of human thought that have given rise to such irrational lenses on reality through hyper-rational extrapolation. Dombis states that his aim is to:

convey a vision of the world in terms of itineraries [sic] and displacement, offering another kind of mapping in which networks get into the picture...to confront the human viewer with their own primitive irrationality through my artworks, artworks that result from an abuse of technological processes. (Dombis 2004)

This agenda is precisely a confrontation with the parallax of subjectivity and a disruption of the Virtuality of consciousness, through which we might achieve a critical contact with the Real of our technological age. Though the computer, as an embodiment of machinic processes of rational logic, appears as the mediating tool for his work, it is the “principles of self-reproduction, proliferation and excess” (Debailleux 2008b) upon which his artistic process rests in the exploitation of and challenge to the viewer. The stream of practice in works such as *Rizong* (1998-1999), *Antisana* (2000-2008), *Hyper-Structures* (2002-2004) and *Spin* (2006-2012) spans over a decade of such exploitation of simple functions taken beyond their visual limit into the realm of excess and disfunction. Across prints, video and site-specific installations, the use of simple artistic gestures – lines – reveals in these works a creative



Fig.14 Spin (2009) © Pascal Dombis
Computer generated images from excessive algorithmic iteration.

⁶ An elliptic, non-euclidean geometry in which metric properties change through space and parallel lines do not exist (see Riemann 1873), creating a mathematical basis for the curvature of space-time in relativity.

statement that is “not interested in their discrete particularities or aesthetic qualities, but in their excessive accumulation as well as in the various mental scapes conjured up” (Amine 2011). This exposes the role of the algorithms used for such work as a desiring-machine that only works artistically through its disruption and disfunction, as we have seen in the self-positing nature of Virtual consciousness in creating the cognitive landscape of the surface of the subject, but also creates a new mode of mapping the relation of thought to technology. There is here a cartography not only of a subject between landscapes but of subjective landscapes that are themselves constantly shifting. Dombis creates such a mapping in his excessive use of abstract lines, circles and spirals as both objects and forces.

By placing the line as a gesture of the Real – excessive in its use but lacking in cognitive signification – these geometric works construct themselves iteratively as the perpetual self-positing of the subject. The partial objects, as a dark energy of the visual field, are drawn into the assemblage of the work through this excess, as they “always proliferate by tens of thousands like an immense digital tapestry, the epidermis of the world” (Buci-Glucksmann 2012). Here Dombis is negotiating what is labelled here as the relation between emergent Virtual and presupposed Real, for the individual line exists only on the surface once posited by the functioning algorithm of the work, while the entire assemblage forms an artistic BwO, a “surface like an immense real-imaginary continental map” (*Ibid.*). This is the quasi-causal relation between the Real and the Virtual: the former appears as the cognitive ‘material’ from which the latter is formed; the latter instigates the separation of the former as ‘object’ out of the unknowable flux of the void. In Dombis’ geometric abstractions Frank Popper identifies a “new conceptual space that emerged through self-programmed iterative hyperstructures. We are here already at the heart of the virtual sphere” (Popper 2007). Dombis labels these emergent structures “Irrational Environments” (2004), expressions of “supra-rational excess”⁷ (Nechvatal 2005) in the inherently excessive functioning of Virtual consciousness, manifested as art through “complexity, perpetuation, enrichment and chaos...a relentless machine-logic bent on achieving a contemporary techno-hyperirrationality” (Popper 2007). What Dombis is aiming to expose is the inherently irrational nature of rational thought, pushing consciousness and symbolic structures to their extreme to reveal what we label here as the Real in the Virtual, the necessarily inaccessible objectification of a thought, which Deleuze aligns with expression and sense as the fourth and most problematic element of a propositional logic (2004b, 22). Even the imagery engages with this emergent structure surrounding the notion of the unrepresentable, for example in *Antisana II* (2000/2008) which “opens out like a true-

⁷ Suprarational: “transcending the rational : not to be comprehended by reason alone” (Merriam-Webster Dictionary 2014).

false fractal butterfly, a meshing together of lines and spirals, in which a million curves engender a being as airy as it is baroque" (Buci-Glucksmann 2009). It is the self-similarity between the void of the Real and the true void of subjectivity that enables a glimpse of the inaccessible space formed at the core of consciousness, mirrored in the self-similarity of the Virtual as an infinitely scalable pure function that creates the surface of the subject. This excessive reiteration of function develops "the fractal loop's potentialities" as the "infinite combinations of geometric structures" (Popper 2007) forming the abstraction of the BwO that we call subject. Dombis explicitly confronts the stakes of the Virtual formation of consciousness through the constant processes of emergence that form in his relation to creation, function and consciousness. His 'Irrational Environments' reveal the necessary void within thought as the irrational genesis of rationality, always threatening to re-enter consciousness as madness and the excessive Real: the cause of Virtuality's desire for perpetuation and permutation, lost amidst the processes of thought and re-inserted through the "new regime of virtual and post-virtual flux-images" (Buci-Glucksmann 2012) that form his geometric, abstract and algorithmic practices.



Fig.15 Antisana II (2000) © Pascal Dombis

2.4.2 LENTICULAR DISTORTION

The construction of such images as emergent irrationality follows the emergence of consciousness in the initialising 'it from bit' gesture by which the fundamental yes-no binary question is the act of self-positing. Deleuze and Guattari insist that "art takes a bit of chaos in a frame in order to form a composed chaos that becomes sensory" (1994, 206), that is, that the artistic gesture attempts to draw something from the unrepresentable void into representation as the Real. In this objectification of the void the Real emerges within the Virtual frame of consciousness, as expressed in Dombis's work. Christine Buci-Glucksmann writes of the spatial experience of the works in *Géométries Irrationnelles* (2008):

As you walk along the chromatic wall of post-assembled panels, your horizontally evolving gaze discovers the metamorphosis of these seemingly straight lines, which burst suddenly into fragments of ellipses, like primitive rockets of chance colours blending together in an almost pictorial chromatic mass. (Buci-Glucksmann 2009)

Where his earlier works tended to spread virally across walls, covering spaces from one point outwards, the later strands of practice that have emerged bring the self-mediating process of framing into clearer view. There is here a progression of the iterative expression of partial objectifications of code with the use of lenticular lenses to distort the images as the engaged spectator moves through the space of the gallery. Dombis constructs a literal visual parallax



Fig.16 Irrational Geometrics (2008) © Pascal Dombis

between the image, the lenticular and the spectator, in order to confront the conceptual parallax of subjectivity in relation to consciousness and technology. Placing the computer generated images behind a lenticular lens enacts a 'post-digital' practice that reinserts physical parallax over the coded realm of the digital. The displacement of the images necessitates a displacement of the subject, and the abstract mappings that disrupt rational thought in their confrontation with the processes of such thought display a constantly shifting surface that exists as a Virtuality between the subject and the work of art. These series of works – such as *Post-Digital Mirror* (2006-2013),⁸ *Post-Digital Surface* (2010-2013) and *Post-Digital Blue* (2013) – embody Land's statement that the construction of true subjectivity is a matter of "parallel de- and re-territorializations ... there is no human subject outside language and technology ... Rather, it is a specific stratification...that produces the distribution we usually call 'human'" (Land 2005, 31-2). The subject exists only in the Virtual as stratifications on the BwO, only as the organising of its own consciousness into and onto the surface of subjective reality it inhabits.

The layering of monochrome digital images beneath the parallax of the lenticular lens creates a depthless density that appears only as a surface between the work and the engaged spectator. Just as Mignonneau and Sommerer's project *Solar Display* (2008) with Michael Shamiyeh looks for "new display possibilities...the potential of modern media facades as membranes" (Mignoneau, Shamiyeh and Sommerer 2008), a similar effect occurs in Dombis' works. As Henri-François Debailleux describes, "when the digital prints are covered with lenticulars (functioning then as optical lenses), the number of points of view grows and multiplies according to the viewer's physical displacements or changing angles of vision" (2008b). This suggests a simple and direct visual parallax that disrupts the images as a purely aesthetic gesture. However, the labelling of such works as 'post-digital surfaces' implies an awareness of the emergent work within the gaze of the engaged spectator, just as a given world emerges within the cognitive gaze of Virtual consciousness in parallax as a causal ontological gesture. While Popper insists that "geometric considerations are at the heart of the iterative hyperstructures and the abstract digital wall prints of French artist Pascal Dombis" (2007), Debailleux looks beyond what appears on the surface of these later works into a conceptual agenda regarding the subjective extension of logic and thought, stating that what Dombis seeks:

is not optical or geometrical effects ; his art aims at showing, out of excess, how a given as simple as a line can engender multiversity: in other words, stretching the line to unleash the potentialities and complexity of the real. (Debailleux 2008b)

⁸ See <http://dombis.com/works/post-digital-mirror/> for images and videos.

In this unleashing of the Real, we see the generative processes of the lenticular works as a mirror against which to view our own perspectival position, not only physically but cognitively as a challenge to the perpetual functioning of Virtuality. Buci-Glucksmann's labelling of Dombis as a 'post-virtual' artist (2012) is thus understood not only in the sense of the media he employs – although it is certainly true that his use of the digital as a tool for confronting consciousness treads a critical path beyond merely the aesthetic use of technology – but in the direct Virtuality of consciousness. This reveals what Daniel Smith summarises as Deleuze's problematic conception of the new, whereby "when the virtual is actualised, it *differentiates* itself, it produces the new" (Smith 2007, 17), which is "not simply a question to be addressed in a remote region of metaphysics, but rather the primary determination of Being itself" (*Ibid.*, 18). This is the problem of genesis underlying the existence of a subject, a problem that Dombis approaches in his challenge to the perpetual differentiation of algorithmic subjectivity as the Virtual separation from the chaos of the void onto a smooth shifting surface that deterritorialises the subject, the work and the gaze itself as a set of pure relations that bring what is understood as the work of art into being with the engaged spectator.

This shifting of the subjective territory is expanded beyond abstract visual expressions into the symbolic realm in works such as the *Eurasia (Google_Color)* (2009-2013) series and the *Eurasia* (2012) exhibition in which elements of this were included, as well as *SpamScape* (2012) and other reinterpretations of works using images and text. Dombis applies his generative processes not only to abstract lines and curves, but also to fragments of text or images drawn from internet search engines on a specific theme. This process has been described as "an open fragment of enigmatic reality still to be deciphered in its symbolic ambivalence" (Amine 2011). When embedded in the shifting relations of subject, object and lenticular lens, these works enact a levelling of geometric and symbolic, visual and cognitive structures under the mediating frame of Virtual consciousness, forming the smooth surface of a complex reality that we call subject. This is an expression of what Tegmark labels the fourth level of the multiverse, in which "mathematical existence and physical existence are equivalent, so that all mathematical structures exist physically as well" (Tegmark in Carr 2007, 118), which is here the equivalence between Meaning and Existence that form the structures of the subject. This is the necessary mode of spectatorship for Dombis' semantic works, in which Kay Heymer notes that "aspects of formal and inner perception blend together" (2012). The frame, whether it be geometric or semantic, must be challenged, and the lenticular parallax used frequently in Dombis's work draws the engaged spectator into a confrontation with their own methods of perception in thinking the use of technology within both the gallery space and the space of our subjective reality.

2.4.3 TECHNOLOGICAL DISRUPTION

It is this rethinking of our relation to technology that draws out the confrontation of thought as a mediator in Dombis' work. He has said of his relationship with new technologies that they are "tools, and nothing else but tools" (Dombis in Debailleux 2008a, 37), that enable a challenge to traditional tools and cognitive processes in the creation of his work. This focus on process mirrors not only the functioning Virtuality of consciousness that Dombis confronts in his hyper-rational irrationality but also the notion that "contemporary physics essentially is a purely operationalist theory" (d'Espagnat 2011, 1714). It is the disruption by proliferation through which Dombis acts, reiterating the gaze onto simple objects fragmented across the surface of spectatorship. This is his relation to a parallax of technology: a simultaneous positing of too many views to comprehend that creates a rupture of lack within the gaze. Heymer says of Dombis' lenticular works that "depending on the observer's point of view it can generate different pictures and create a three-dimensional ever changing impression that prevents the perception of a complete form" (Heymer 2012), and it is this step beyond the simple visual parallax that draws digital technologies into a role of lack through excess. The BwO as complete surface becomes a lost object when we try to view and map it in its entirety. Consciousness is larger than its own gaze, and it is the failure of such a gaze that draws the engaged spectator into the "phenomenology" of an absent reality" (Buci-Glucksmann 2009) that is created through Dombis' works. This lack through excess is explored more thoroughly in *What_Next?* (2011),⁹ which uses images drawn from internet search engines to answer questions of our origins, purpose and future. These images are projected onto three screens on the ceiling of a church, played in series at aleatorically varying speeds, from slow fades that make visible the individual pictures to rapid flourishes that render the visual stimuli incomprehensible.

Patrick Amine comments that instead of answering the questions posed, this "iconographic maelström finally appears as a phenomenological suspension of the world, as it does lead to the terminal formula: "Know Thyself"" (2011). Dombis' semantic and iconic questioning amid a disruptive relation to parallax spectatorship through technology displays Bernard d'Espagnat's confrontation with the dilemmas of contemporary physics concerned with operations rather than matter. Indeed, d'Espagnat points out that in quantum physics, matter is "a set of mere appearances to consciousness" (2011, 1715). This counters the materialist scientific imperative of the primacy of matter towards an emergence of

⁹ See <http://dombis.com/works/what-next/> for video and images.

consciousness from appearance in a self-referential loop of Virtuality in the self-positing of the individual subject against a non-existent material reality. To resolve this, d'Espagnat claims, there is necessarily an inaccessible reality from which consciousness emerges to posit the accessible reality of matter and appearance, so that "consciousness emerges from something that lies beyond our intellectual grasp" (*Ibid.*) in the most absolute and necessary sense. This expresses within the limitations of a scientific framework what Rancière describes as the unrepresentable in art (2007) and Galloway expands to the digital (2011); what we have here insisted on as the inaccessible void of subjectivity from which consciousness emerges Virtually in self-positing an 'objective' (and objectified in the Real) reality. This reality is thus always lost beneath the appearances of the BwO, the void remains inaccessible from the surface of the subject. Dombis's questioning of our existence and purpose thus offers a direct challenge to the smooth functioning of reason that obscures the conditions for subjectivity beneath the perpetual proliferation of a fragmented desire for function.

The rupture in such a surface that is necessary to challenge our smooth functioning of consciousness and insert a contact with the Real, through which we might conceive a concept of the void, is brought into plain view in relation to contemporary technological and cognitive mediation in Dombis' *Crack* (2010-13).¹⁰ Applying the use of internet image searches to the word 'crack', the results are here displayed split across two adjacent screens, each of which is on a vibrating motor with a randomly shifting speed that also controls the rate at which the images change on that particular screen. Between the two monitors a spatial parallax is formed by the splitting and vibration of the images and a temporal parallax is formed when the two displays change and vibrate at different rates. Within this parallax of mediation by technology a new critical space is allowed to emerge which "makes it possible for the viewer to immerse himself or herself in the *cracks* of our time" (Dombis 2013). This work exemplifies a critical approach to constructing a challenge to the self-mediation of the emergence of consciousness from that which is necessarily inaccessible to consciousness (a world from consciousness from the void), leaving an open question as to what lies between the cracks of our society. What is presupposed as a mind-independent reality is the flux of the void and, through the use of Virtual processes taken again here to the extreme in rendering the information incomprehensible by representation, it is possible in these works to create a space in which the relation of the subject to what lies beneath can be staged. The reality of this space between the cracks is, like a quantum vacuum, "by no means a simple empty space where nothing ever happens" (Lambrecht in Figger, Meschede and Zimmermann 2002, 197),

¹⁰ See <http://dombis.com/works/crack/> for video.

but rather a space of the genesis of subjectivity. The parallax of consciousness that must be sought in these disruptions of self-mediating Virtuality is thus between the two stages of the creation of the subject: the first stage Žižek describes as the process through which “embodied reality is the result of the “actualization” of pure eventlike virtualities” (2012, 22), and the second he describes as the moment in which “the emergence of thought and sense signals the moment when the constituted reality, as it were, *reconnects with its virtual genesis.*” (*Ibid.*, 23). What works like *Crack* create, through literal visual and technological parallax, is a rupture between these two stages in which the Virtuality of the creation of the subject can be made clear, a confrontation with the inaccessible void can be staged, and a new perception can emerge of our own engaged spectatorship in subjective reality. The project of Dombis, as with Baecker or Bolognini, is to use technology to render visible that which is unrepresentable, not by creating images of such inaccessible notions, for such a gesture would remain empty of critical content regarding the void, but rather by creating disruptions in the smooth functioning of our self-mediated perceptions through which we might catch a glimpse of the parallax position of our Virtual consciousness.

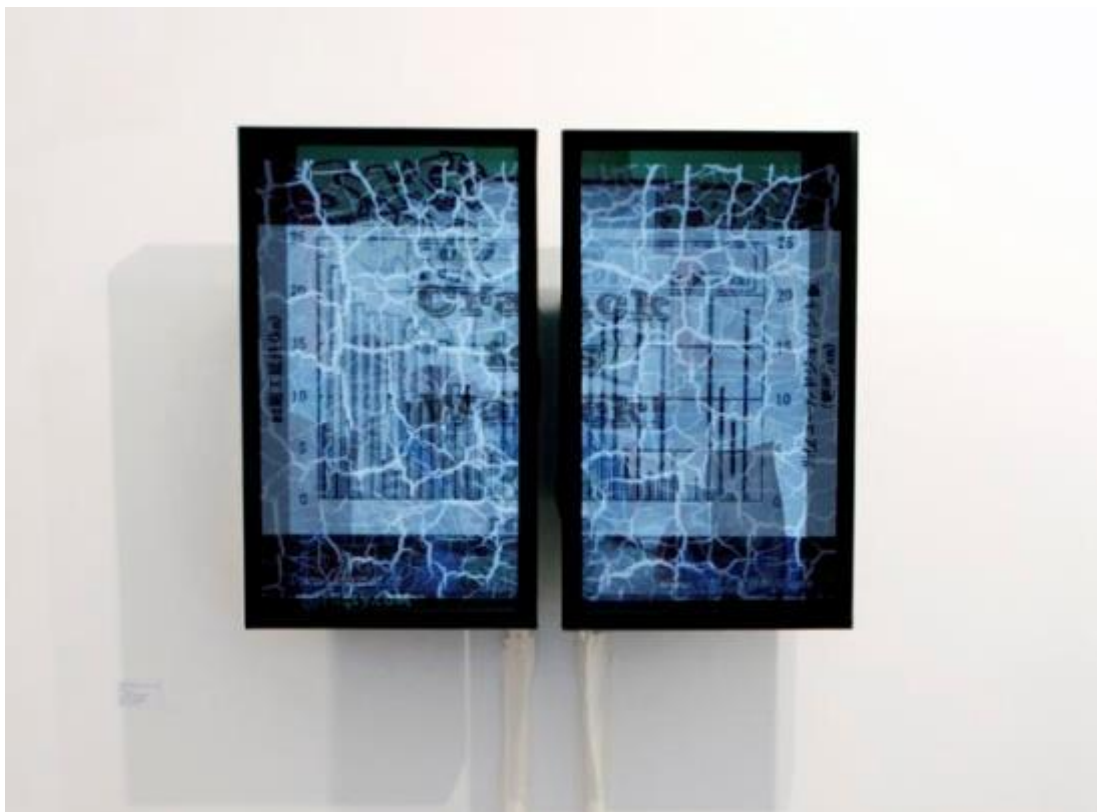


Fig.17 Crack (2012) © Pascal Dombis

The two screens are mounted on servos that move at randomly different rates, controlling the disjointed progression of images across the crack between the two interfaces.

2.5 INACCESSIBILITY

Before concluding this chapter, the persisting problem of attempting to understand and represent the void must be confronted. Rancière's failure of representation (2007) remains, and artistic gestures relating directly to the void only further the notion of its unrepresentability. The *Void* collection of works by Polish digital art collective Goverdose 2.0 (2012-2013) shows this dilemma of expression, as each individual artist or image seeks to represent the concept only through a specific framework, whether spatial (including cosmology and biology) or conceptual (including technology and semantics). These works largely enter only one side of the debate, focusing on an individual internal or external void, rather than bringing into our awareness new and challenging notions of the void as such. All that emerges from these symbolic works is a representation of the desire-for-representation. Only Trisme Trs' *Avoid*, *Void Archipelago* and *Interdimensional Void* make steps in directly confronting the unrepresentable nature of the void, placing a human figure or the words 'avoid' and 'void' (with the 'i' styled as a key) against ethereal spaces. This highlights the symbolic distance of human perception and language from the void, suggesting an alternative space of representation (and, by extension, cognition) in which to confront the void.



Fig.18 Void Archipelago (2012) © Trisme Trs

John Smythies draws from string theory such an alternative notion of the place of the subject in the universe, positing “three fundamental entities – space-time, matter and consciousness” (2003, 47). Here the subject, as the construction of the void beneath the forces of functioning consciousness, emerges as “a new space in addition to all currently postulated physical space-times...a brane of its own” (*Ibid.*, 52). What Smythies is suggesting is an extra dimension to our understanding of the universe, with the implication that the membrane of consciousness is an abstract surface beyond our comprehension of space and time. As Smythies describes, “consciousness may be in the brane not in the brain” (*Ibid.*), that is, held across an epistemological void by our inability to comprehend our construction as a multi-dimensional hyperspace, drawn from Andrei Linde’s conception of consciousness as an abstract and inaccessible part of physical reality (1990). The role of art must then be to represent not the void itself, but the relations and structures of this hyperspace of the subject that allow the void to emerge through its absence in our view of the work, for example in the simple addition of the word ‘void’ in Trs’s work that points out the absence of a true void in the image while implying a consideration of its relation to the visual space beyond representation. This expresses François Cheung’s conception of the void as a “nodal point where potentiality and becoming interweave, in which deficiency and plenitude, self-sameness and otherness, meet” (Cheung 51), which is here the originary parallax position of lack and excess from which the BwOwB of the subject can emerge.

The impossibility of accurately representing the void is thus an integral element of the construction of consciousness. Beyond our modes of perception in the position of parallax, is it then possible to alter our perception in such a way as to make visible to consciousness the void of its own subjectivity? Buci-Glucksmann tells us, in analysing the work of Dombis, that “with the virtual, you may work on the complex and original forms of humanity, as well as exercising a temporal and increasingly global mode of art” (Buci-Glucksmann 2009). Between the dimensions upon which the work acts – individual or social, local or global, physical or digital, material or cognitive – we can open a space for critical perception of the emergence of consciousness and the creation of subjectivity. As was discussed in Chapter 1, the self-mediation of consciousness is what must be disrupted, to insert a rupture of perception within the Virtual surface of the BwO towards the Real as the objectification of the void. By bringing into artistic representation the failure of representing the void, and the Real as merely a lost fragment of it, we can create a space in which the implication of the true void of subjectivity can emerge even in its explicit absence. Carl Jung tells us that “the artist’s life cannot be otherwise than full of conflict” (2001, 173), and this inherent relation to antagonism is seen in the parallax of consciousness and the void. Žižek states that the artist of parallax is one who

shows both sides of the argument at once, necessitating an act of “self-destruction, which is itself a symbolic statement, the only work of art available” (Žižek 2009b, 128). Pursuing a creative parallax gesture that makes contact with the void of subjectivity requires the symbolic destruction of the structures of consciousness. Critical digital culture must exploit potential remediations of technology in order to reveal the self-mediating forces of consciousness, challenging the relations between the Virtual and the Real and the structures of such self-mediation that block the void from its representation and comprehension by consciousness.

If the inaccessibility of the void is an integral part of the construction of consciousness, we must question the need to disassemble the Virtual structures and attempt to make contact with the necessarily unknowable. If the unrepresentable is a necessary condition of representation, then it is possible that we must accept the void as being beyond our comprehension. However, the culturally unrepresentable only appears at the discovery of the limits of representation, which are being ever furthered into new areas of creative apprehension. Blackhawk notes Dombis’s staging of “impossible figures somewhere between what the human eye can see, the human mind can encompass, and that oft-regarded, evanescent suggestion of infinity” (2003), suggesting a specific negotiation of these boundaries – what we have called the surface of the subject – and into the realm beyond consciousness. Deleuze and Guattari state that “creation is the aesthetic varieties or scientific variables that emerge on a plane that is able to crosscut chaotic variability” (1994, 207), which is to say that artistic practice, in confronting the limits of consciousness, inserts a movement across the void through contact with the Real. Between these structures of consciousness and the chaotic flux of the void is the region our culture must navigate. Indeed, Buci-Glucksmann has pointed out that “contemporary art has never ceased to waver between monumental “archaeological” art and an art of the ungraspable and the ephemeral” (Buci-Glucksmann 2009). Between the edifice of Virtual structures and the unattainable void of the Real is the location of the intervention within consciousness by contemporary art. If contemporary art is also post-conceptual art, that which “articulates a post-aesthetic poetics” (Osborne 2010), then applying this to the subject necessitates an articulation of a post-subjective expression. Critical culture necessitates a disruption of the structures of consciousness, in a reorganisation that brings into view the subject’s position. While the parallax of the void remains inaccessible to the human subject, a post(human)-subject enables a view of the self that includes the position of parallax and an understanding of the void.

2.6 CONCLUSION

This chapter delineates the problems in confronting the void of subjectivity. Žižek's conception of the void as the unrepresentable point of reference for parallax is read alongside Rancière's understanding of the necessity of an unrepresentable element as the condition for representation to occur. The function of the Real, the objectification of the void as part of the assemblage of the subject, is therefore a necessary blind spot in our understanding of consciousness. This is expanded through the Deleuzian BwO by placing the body, seen here as the Virtual in the surface assemblage of consciousness, itself as a lost object to representation. We can never fully apprehend the functioning of the subject – there is a necessarily unrepresentable stain on any hyper-cartographies of physical, digital and Virtual spaces – and this Virtual assemblage thus appears as a BwOwB. The shift in cultural conceptions of reality and the increasing tendency in creative practices away from representation of fixed subject towards a functional representation of the processes by which subjects and realities form, leads the discussion to the underlying unknowable nature of reality itself. The void as it appears in quantum physics provides an array of perspectives attempting to draw this unrepresentability into consciousness, through the forces at work in even a vacuum state and the many unobservable particles that are necessary for the universe to form. These differing conceptions, when brought together, offer a series of parallax perspectives that inform our view from physical and digital modes of consciousness in approaching the void of the subject. The decentred subject has therefore been reconsidered as desubstantialised, a 'nowhere' of the subjective assemblage as pure function, expressed in relation to code, abstraction and digital machinic processes in Dombis's work dealing explicitly with the inherent irrationality at the heart of reason within the formation of the world and a critically engaged cyborg subjectivity. The discussion has drawn these threads together under Rancière's notion of the unrepresentable to negotiate the relation between the Virtual formation of the subject (itself a lost process to its own understanding) around the presupposed Real (as an objectification of the subject's inaccessible core). The following chapter furthers this investigation into the Real of specific physical and digital worlds in the form of the body and its digital representation as a lost object within the Virtual assemblage of cyborg consciousness.

3 THE ABSENT SUBJECT *OBJET A-VATAR IN CYBERWORLDS*

Extending the discussion of the void of subjectivity, this chapter focuses on the displacement of the void in the Real in relation to the antagonism between physical and digital worlds. The inherent loss of the subject in the Virtual functioning of consciousness is expanded into the privileged position of the physical within the structures of the subject: the persistence of the human over the cyborg. This hold of the physical is challenged, drawing the Real into the loss of substance in contemporary society and subjectivity. The body is confronted as the manifestation of this problem, the phenomenal perspective on the physical world lost amid the cyborg development of consciousness in the ever-expanding digital world. This leads to a critique of the nostalgia arising from the prevailing view of the physical body as primary. Žižek's brief dismissal of the privileged role of the body is expanded through his use of the Lacanian *objet a* to suggest a loss of subjectivity inherent in embodiment, placing the body itself as a lost object desubstantialised between presence and absence within consciousness as it constructs the parallax perspective of the cyborg subject.

An argument for disembodiment is therefore staged, using the digital avatar to interrogate the relation of the subject to its body, offering a flexible and iterative array of representations of our perspectival position in its engagement with alternative spaces. The conventions of avatar mediation are analysed in the prevailing anthropocentrism against disembodied subjects moving between bodies at will. Deleuze's concept of difference is applied to the Virtual manifestation of an identified subject, beneath which the structure of faciality allows for a confrontation with the persistent Real of what is lost from the subject in its repetition between physical and digital embodiments. The problems of substance inherent in quantum physics, particularly Heisenberg's uncertainty principle, allows for a discussion of the role of the observer as a shifting embodiment expressed in the use of avatar-mediation constructing alternative modes of engagement and representation. Second Life (SL) provides a case study as a space in which artistic interventions challenge the familiar anthropic representations of avatar-mediation, extended into object, expression and interface of the subject in the digital world. This structure of reconceiving digital embodiment reasserts the physical body as lost object and suggests, through the desire caused by such an *objet a*, the function of the body as a Virtuality; returning to Žižek and Lacan for the notion of the big Other, applied to embodiment in the desire for engagement with a world.

3.1 DISEMBODIMENT

The conflation of the digital avatar with an attempted representation or replacement of the human physical form derives from a confusion of the 'natural' approach to our relation to the physical body itself. Although it is difficult to escape what Žižek labels the "imbecilic inertia of material reality" (2012, 127), we must broaden our scope of the 'avatar' towards a genuinely digital understanding of the term and its relation to consciousness and subjectivity. The starting point for such a shift is to acknowledge Žižek's opposition to Merleau-Ponty's claim of the body as "our general medium for having a world" (2002, 146), an oft quoted trope in scholarship concerning the body and the digital, that "I never "am" my body" (Žižek 2009b, 227). While it is useful to consider Merleau-Ponty's division of the objective and phenomenal body (2002, 121f), along with his acknowledgement of their complex interlinked nature (*Ibid.*, 121-2n), the bridge across the Cartesian mind-body split he employs is not readily transferred to the digital realm without the anthropic conflation from which we must digress. There is a 'suspension of disbelief', a common dilemma for the creation of convincing digital modes of embodiment, already at work in this conception of physical body. The separation of objective and phenomenal body relies on a subjective divide of familiarity and interface, whereas we might very well describe touch typing or a well-used game controller as being "potentialities already mobilized by the perception of [the object to be acted upon]" rather than "objects to be discovered in objective space" (*Ibid.*, 121). Just as young children and adolescents learn and relearn to negotiate their changing biological frame, so too does the digital subject familiarise themselves with their computer interface, to the extent that the medium itself takes on, to consciousness, a level of phenomenal transparency commensurate with Merleau-Ponty's conception of the body. We might thus use Negroponte's rejection of McLuhan's famous maxim, when he writes: "the medium is not the message in a digital world. It is an embodiment of it" (Negroponte 1996, 71), to expand the word 'avatar' to a definition between the Hindu myth and its common reappropriation in digital culture, as "a visible manifestation or embodiment of an abstract concept; archetype" (Collins English Dictionary 2013). Here the subject itself constitutes the abstract concept, in the virtuality of self-positing consciousness, and is represented in both physical and digital worlds by a collection of data (nucleobases or bits) according to certain archetypes of what is recognised as 'human'. There is an obvious link here to Jungian archetypes (another word rooted in deific manifestation), described as the universal "contents of the collective unconscious" (Jung 1968, 4). It is perhaps not surprising

that the avatar has such firm links to anthropocentric embodiment, yet the Jungian construct that defines the Reality of the subject supports a broadening of an anti-anthropocentric embodiment in abstract, oneiric and super-natural forms.

This expanding of the embodied form reveals the notion of form itself as an objectification of the unattainable. If we never 'are' the representation of ourselves, the body we occupy always lacks an element of genuine subjectivity, a filling in of the object with the void of consciousness. This lack places the body indeed as objective, but as the *objet a* that constitutes the 'in me more than myself' as a cognitive externalisation of archetypal, unconscious impulses. The objective body, however, is supported by the constructs of fantasy into a form of transference that places it in lieu of the phenomenal body. This interaction, between bodily *objet a* and illusory framework of phenomenal connections with consciousness, brings to light the same processes in any 'bodily form', where even the fleshy mortal frame we inhabit in the physical world only ever takes on the role of the phenomenal body through fantasy and transference. Physical and digital bodies thus share the same self-positing illusion, their only difference lying within the fundamental formation of the subjective relation to such bodies within consciousness. This is the heart of the physical-digital parallax even at the level of embodiment. The minimal difference in the perspective of consciousness within its avatar demonstrates the manner in which "the position of enunciation already influences and informs what comes to be enunciated" (Gunkel 2010, 139). This position of enunciation is also a position of embodiment. Consciousness itself remains always disembodied, acting in relation to its physical or digital manifestations as a lost object, expressing its excessive 'in it more than itself' according to the particular parallax of the individual participation with a given world within subjective reality.

3.1.1 THE STAIN IN MY GAZE

The very term 'avatar' could be considered an *objet a*, a lack and excess, in its relation to our gaze and engagement with digital realms. Filled with data, the excessive flow of information through the avatar into Virtual Existence is more than our view of the representation makes visible. What is viewed through the interface screen as our inclusion within a given digital realm necessarily contains the gesture of parallax within perception. Žižek writes that "the subject's gaze is always-already inscribed into the perceived object itself, in the guise of its 'blind spot', that which is 'in the object more than the object itself', the point from which the object itself returns the gaze" (2009b, 17). Applied directly and literally to avatar-mediated environments, this supports the notion that "the reality I see is never 'whole' – not because a

large part of it eludes me, but because it contains a stain, a blind spot, which indicates my inclusion in it" (*Ibid.*). The rendering of Real-Meaning, as 'excessive' data, into a specific embodiment of Virtual-Existence, as 'lacking' gaze, only creates a digital presence insofar as the subject is engaged with what Lacan identifies as a "rupture, split, the stroke of the opening makes absence emerge" (1977, 26). Beholding the stain of self-representation as an avatar within its own gaze, the digital subject emerges through absence, negating the digital equivalent to the physical illusion of embodied presence. Such an engaged position demonstrates that "'subject' is the name for a crack in the edifice of being" (Žižek 2012, 41); an emergent formation of absence.

This mark in the edifice of the computer screen has been expanded in recent research, to encompass a broader scheme of engagement. David Hill's thesis expands upon the work of Gunkel (2010, 128-9) to separate four 'standard' definitions or expressions that qualify under the notion of 'avatar': "animated avatar [e.g. Second Life], web-cam avatar [e.g. Skype], profile avatar [e.g. Facebook], and portrait avatar [e.g. Twitter (image plus 140 character caption)]" (Hill 2011, 50). By applying the emergent absence of the Lacanian gaze to each of these manifestations of the digital subject as a simultaneous lack, of being, and excess, of data, it is possible to extend the Žižekian notion of consciousness as always-already false: "the avatars that are encountered within the virtual world are not the representatives and delegates of some independent and pre-existing real thing. The order of precedence must be reversed" (Gunkel 2010, 136). This emergent simultaneity of subjectivity between physical and digital worlds upturns the conventional relation of humans to their 'real' physical body. Philip K. Dick, an author well-established in confronting issues of fleshy human authenticity, predicted: "Fake realities will create fake humans. Or, fake humans will generate fake realities and then sell them to other humans, turning them, eventually, into forgeries of themselves" (Dick in Dick and Sutin 1996, 263-264). However, Žižek insists that reality "always-already was virtual" (2007, 193), becoming here 'humanity always-already was a forgery of itself'. That is, whether in a computer simulation or physical universe, the authentic gaze, the primal existence, is merely presupposed in the Virtuality of an always-already false consciousness.

Moving the discussion of avatar-mediated environments beyond the limits of a flesh-memory that constrains digital interaction to the merely representational necessitates a shift away from an absence *or* presence of the body towards the *presence-of-absence* of consciousness and its gaze. The spectre of early avatar-mediation from 1990s digital art persists in contemporary practice, and those who manage to progress beyond such a, now historical, approach seldom garner the theoretical implications of this move. While Moser's volume on the 1992 *Art and Virtual Environment Project* at Banff has set the tone for critical

discussions of avatars, the analytical texts reside firmly within the cage of physicality. Emphasising “the crucial role that the body plays in constructing cyberspace” (Hayles in Moser 1996, 1) and the notion that “we are embodied creatures” (*Ibid.*, 3), and insisting that “the psyche clings to the memory that this space is a representation, that is, it clings to a memory of the real body and its formulation in physical space” (Tenhaaf in Moser 1996, 60), the work is rooted in traditional hierarchies of ‘reality’, yet forms an important historical foundation for theories of avatar-mediation that embrace the role of artists within the development of technology.

Hayles, Hansen and Ihde¹¹ have all furthered this focus on embodiment, discussing “themes of virtual bodies in relation to lived bodies” (Ihde 2002, 3) in which “the ultimate goal of virtual embodiment is to become the perfect simulacrum of full, multisensory bodily action” (*Ibid.*, 7). While situating knowledge attempts to take into account the position from which physical-digital epistemology emerges, placing it firmly within the physical body reduces the analysis of the cyborg subject to prosthetic embodiment. This approach fails to fully take into account the system of extension (of consciousness) already at work in the physical body, thus missing the basic tenet of second-order cybernetics: the analysis of the observer as part of the system. This should not be a return to physical embodiment, but rather the theoretical juncture at which a parallax conception of the cyborg is needed to confront the system of consciousness as it moves between physical and digital worlds. Through the Žižekian model of parallax subjectivity, applied directly to avatar-mediated spaces, such fears of a “community of shattered egos”, where Virtual-Existence “teaches us to dislocate our proper place” (Ronell in Moser 1996, 126) must be transformed into a discussion of two worlds, equally Virtual, in which the engagement of consciousness through the self-directed gaze allows for a progress in artistic conceptions of digital presence. It is necessary to first ‘disembody’ our view of engaged consciousness to avoid constant attempts to construct the illusion of presence, and instead embrace the potential for an expressive absence, what Ascott hails in SL as the “power to provide for a release of the self, release from the self...our ability to be many selves” (2008, 204). This recognises the many possibilities of embodiment while focusing on the disembodied subject between and outside itself. If the avatar as *objet a* is always-already lost, then we must not view disembodiment in the shift from physical to digital worlds as a ‘presence *followed* by absence’ but, rather, as the simultaneous potentiality available to expression within a ‘presence *of* absence’, a reconception of the process by which consciousness experiences embodiment in and between any given world(s).

¹¹ See *Introduction: The cyborg reconsidered*.

3.2 EXPRESSING DIFFERENCE WITHIN THE SUBJECT

3.2.1 THINKING CONSTRUCTING THE SUBJECT: ME, ISELF AND EYE

Lacan identifies within the construction of the self, beyond the “pre-existence of a gaze” (1977, 72) – the always-already seen – a severed construct of “the eye and the gaze... the split in which the drive is manifested at the level of the scopic field” (*Ibid.*, 73). This inherent split, of the self in the gaze, also always incorporates Žižek’s parallax stain, “marking the pre-existence to the seen of a given-to-be-seen” (*Ibid.*, 74). The gaze itself, and its conditions, are thus a necessary presupposition of the subjective construction of any ‘self’. Similarly, within thought it is possible to separate the ‘I’ that thinks and the ‘I’ that thinks it thinks:

Even if thinking seems to exist in the moment the thought is thought, this does not necessarily mean that any ‘I’ has to exist. It merely means that something at that same moment thinks ‘I’ and possibly has an ulterior motive in doing so. (Bard and Söderqvist 2012, 525)

This illusion of the cogito is bound into the process of perception from the parallax position in the void-core of subjectivity. Merleau-Ponty’s formulation of consciousness within a body is thus founded on an erroneous assumption of the nature of thought bound into perception with the illusion of an existing body. The formulation must therefore be expanded to include an ‘I’ that perceives (/thinks), an ‘I’ that thinks it perceives (/thinks) and an ‘I’ that is in the perception (/thought) itself. There *is* only consciousness, separated from its body and its perspective, as a pure function positing itself as the bridge between worlds. The construction of this ‘I’ is inextricably linked to its position as the gaze in an engaged act of perception, the moment in which “I emerge as eye” (Lacan 1977, 82). The self as the stain in the gaze emerges concurrently with the self from which the gaze occurs and the self that cognises the position of the gaze.

Thus the inclusion within the gaze of the subject, the subject beholding itself as object, is the process by which subjectivity is brought into an individuated self. What underpins this construction, however, is the Real beneath the gaze, the presupposed conditions, the raw sense and nonsense of the expression that posits the subject. This quasi-causal force of the perpetual circular drive that constitutes the *objet a* is a mode of repetition. Lacan asserts that “repetition demands the new”...“whatever, in repetition, is varied, modulated, is merely alienation of its meaning” (*Ibid.*, 61), and it is this eternal modulation that both allows for a differentiated self to form and insists on the absence of such a self from the internal workings

of pure consciousness. This circling drive underpinning expression captures the complexities of Deleuzian repetition:

Repetition in the eternal return never means continuation, perpetuation or prolongation, nor even the discontinuous return of something which would at least be able to be prolonged in a partial cycle (an identity, an I, a Self) but, on the contrary, the reprise of pre-individual singularities which, in order that it can be grasped as repetition, presupposes the dissolution of all prior identities. (Deleuze 2004a, 252)

This constant recreation of the singularity from which identities and selves spring is the parallax void of subjectivity. Each fleeting moment of Existence requires a new expression of the Real, whereby the self does not change over time, but repeatedly acquires a new expression. The Virtual function of consciousness is the means by which this Real repetition is differentiated into the concept of an individual identity. As Deleuze writes, "life as *movement* alienates itself in the material *form* that it creates" (1988, 104). The infinite line of desire in the Virtual removes itself from the circular Real of repetition from which it is made manifest.

In applying this process of repetition in the void leading to an expression and differentiation through the shell of consciousness to avatar-mediated worlds, we start from the familiar position whereby "a PC [Player Character] in a VGW [Virtual Game World] can be seen as a combination of a person playing a game and a fictive person whose identity is continuously developed" (Eladhari 2010, 6). However, this continuous development must be extended beyond SL and other non-game virtual worlds, where avatars exist as a becoming between the user and their fictional representation, and into the construction of the digital subject itself. This is not merely a fictional character set in a specific simulated fictional environment, for such could be said of the cognitive processes applied in diverse cultural forms (first-person novels; tabletop role-playing games; cosplay). This level of identity is created between the 'physical' user and their entire gamut of 'digital' identities. This includes the array of 'alts' (alternative avatars) subjects might employ for specific roles, spaces or interactions, like the different personal or professional identities of everyday physical humans.

This raises a complex interaction of selves within the cultural setting of avatar-mediated environments. For example, the artist Kristine Schomaker, creator of the 1000+ *Avatars* (2010-12) collection of (anthropocentric) avatar portraits, reveals an awareness of the tension between physical and digital selves in an interview between her physical self and her avatar, Gracie Kendal, as part of the *My Life as an Avatar* (2010-12) project:

Kris Schomaker: Who are you?

Gracie Kendal: I am your inner conscious, your alter ego, your self portrait, your avatar, your art... I am you.

...

GK: So, who are you?

KS: I am me. I am you. So, why are we here? Oh yea, I remember. I am using you to confront my imperfections and insecurities.

GK: Yea, well here's the thing. I don't like how you're 'using' me (Kendal and Schomaker in Trapdoor 2010)

Despite Schomaker's fixed view of avatars as 'projections' of identity linked to the 'real' user, her project displays an awareness of using avatars merely as psychoanalytical tools for physical 'persons'. However, in this moment of the interview, the avatar itself appears to undermine the physical user's need for transference, resisting its designated role as therapeutic apparatus in dealing with the desires and fears of its fleshy counterpart. What this interview in fact reveals, alongside the inclusion of many anti-anthropomorphic avatars in the portraits project despite Schomaker's own anthropocentrism, is the drive of the unconscious in defining expression between all manifestations of the self. The similarities between the artist and her avatar, along with the many visual 'improvements' made on the avatar's hair, clothes and figure, is less an example of difference in avatar-mediated identity or of a unifying identity that seeks to overcome its imperfections, than a demonstration of the quasi-causal lack central to the subject and the construction of its subjective reality. Any culture of avatar-mediation based merely on the freedom of image in improving the physical form becomes caught in the Virtualising functions of identity, rather than the underlying sense of repetition that bursts forth in moments between the various differentiated embodiments of a multifaceted 'self'.

Each element of identity is constructed and performed by the subject while it uses that specific body to engage with a specific world. This does not rely on an externally consistent set of identities, for as Mirjam Eladhari points out, "*players* are the ones who carry out both the characterisation of and the expression of the true characters of their avatar/PC/persona in a VGW [Virtual Game World]" (2010, 53). To this must be added the construction and maintenance of any identity by the subject in any given world. The role of the subject beneath each of these surfaces of identity is the process of repetition that Deleuze describes as an "emission of singularities, always with an echo or resonance which makes each the double of the other, or each constellation the redistribution of another" (2004a, 251). The subject releases a part of themselves into the singular identity, embedded in a specific world, but in the process the 'echo' of the underlying subjectivity is lost, forming the lack inherent to the BwOwB. The identity appearing as a complete unit is itself a mere fragment, a partial, lost object, an *objet a*, in relation to the whole subject as the absent centre of its own parallax reality. Here the subject *as gap* between physical and digital worlds is the eternally becoming interaction between the various parts: an assemblage between each fragmented aspect of differentiation around the subjective void of repetition. It is not identity but lack that is repeated, for the void forms an infinite circle of nothing amidst the perpetual function of the surfaces of consciousness.

3.2.2 ONE AND ZERO AS TWO INFINITIES

The repetition of the void at the core of the subject and the pure difference that constructs consciousness around such a core initially appear as what Deleuze describes as monad and body respectively:

Monads are each or every one for itself, while bodies are one, some, or any ... Monads are distributive units that follow a relation of part and whole, while bodies are collectives – flocks or aggregates – that follow a relation of the-ones-to-the-others ... each monad expresses the sum of the world, and...a body receives the impression of 'all' the others up to infinity (Deleuze 2006b, 114)

There is here a convergence of two infinities. To Deleuze these are two dimensions of expression and impression. However, when applied to the dimensions of Deleuzian time, as seen in the functions of consciousness: the infinity of expression is repetition, as the circular drive of the present in the void of the Real, and the infinity of impression is difference, as the line of desire through past and future in the functioning of the Virtual. If the level of the one is the function-function of consciousness, then in the void-function we see Lacan's statement that "zero is the presence of the subject who, at that level, totalizes" (1977, 226). That is, the genuinely subjective presence is at the level of the infinite zero: a presence of void, an inherent absence. This is brought into an embodied presence only in the intersection between the two infinities. Žižek identifies, in the unity of the one and the zero, "the singular universal that marks the minimal difference" (2012, 92) between presence and absence within the subject itself. These two infinities do not differ in number, just as the binary 1 and 0 of digital logic do not rest on fixed values but the act of perceptual difference itself.¹² This lies beyond any failing quantification of infinities, for "we do not have units (unités) of measure, only multiplicities or varieties of measurement" (Deleuze and Guattari 2004, 8). The emergence of difference out of the repetition of the subject, its two infinities, is an evental process.

Alain Badiou criticises Deleuze's conception of the one as it relates to the event: situated as time for Deleuze – the unity of infinite past and future that is never the present – and as site for Badiou – multiple acts of a de-unifying evental principle. According to Badiou, "Deleuze poses the One as ontological condition (chaos, the One-All, Life) and as evental result. In contrast, I [Badiou] claim that the One ontologically in-exists (the multiple is 'without-one')" (Badiou 2007, 40). However, within Žižek's Lacanian interpretation of the One as *repetition* in Deleuze, it is possible to reassert the ontological condition of Life as the *externality* of consciousness, while embracing in-existence in the *internality* of the subject-as-

¹² The 'material' difference of binary data can be formed between any two numbers, commonly two non-zero voltages, but it is the *logical* difference, the absolute of 1 and 0 in thought, that constructs the symbolic foundations of digital reality.

void. The function-function of consciousness is precisely the infinite line of one that perpetuates such consciousness itself, and as such is also the presupposition of a one, of life that it seeks to extend in both directions of history. By contrast, the void-function of consciousness is the infinite circle of zero that constitutes the death drive underpinning the void of subjectivity, acting as lost cause of subjective presence. The intersection of infinite one and zero, the extension of binary through endless history and eternal present, through life and death, through externality and internality, thus reaches beyond a mere dualism to Žižek's minimal difference, which is "the noncoincidence of the one with itself" (2009b, 11) and "on account of which an individual is never fully him/herself, but always only "resembles him/herself"" (*Ibid.*, 44). It is for this reason that an avatar never *is* the subject, just as the physical body never *is* the subject, and a genuinely creative and expressive avatar should be a contact point of difference *between* the infinite one and the infinite zero.

Within a computer gaming setting, particularly the ever-increasing variety of MMORPGs (massively multiplayer online role-playing games), the avatar takes on the role of an expression of history, the relentless line of the infinite one. As the player character increases in level (through 'earning' experience) and obtains items (particularly the more unique items gained through completing difficult quests) the avatar's appearance progresses from the standard starting image. This is a historical economy of representation: the more advanced the character, the more customisable and impressive the avatar's appearance. Such an avatar thus takes on a semantic record of the character's history and celebrates the user's actions, creating a new code of signifiers to the game's cognoscenti (particularly other characters of the same 'tier' or higher). However, this also has the effect of reducing the avatar to a meritocratic expression, in the same manner as the economy of 'lives', and introduces a more elitist and controlled aesthetic along alienated 'career paths' rather than the freer, more creative tools available in non-game virtual worlds such as SL that promote user-generated content over a defined visual lexicon of achievement-based signifiers.

This problem parallels what Deleuze and Guattari describe as faciality, a system of white wall and black holes (characteristically the face and eyes) constructed at the intersection of signification and subjectification: "signification is never without a white wall on which it inscribes its signs...subjectification is never without a black hole in which it lodges its consciousness" (Deleuze and Guattari 2004b, 186). This territorialised structure that Deleuze and Guattari label the abstract machine of the face is the inscribing of the black hole of the eyes into the white wall of identity, what has been described in this thesis as the void of the subjective position in the surface of functioning consciousness and its identification. To overcome these structures that shape the formation of a subject in contemporary

informational society, abstracted as surfaces ruptured by the absent position of the gaze, we must avoid the nostalgia of a return or regression to a primitive pre-facial state and instead perform a deterritorialisation or defacialisation through a critical use of the face, towards a probe-head of creative flight (*Ibid.*, 208-210). The anthropocentrism that plagues avatar-mediation extends beyond the visual and figurative into the construction of the face within consciousness across physical and digital worlds. The signifying structures of faciality in the game-based personal history approach to digital embodiment constantly reterritorialises the avatar on the infinite one of the surface of Virtuality and the strata of history, displaying quests completed and directing the future of the character through career path limitations on weapons/armour availability and manner of attire. In this fusion of abstract data and anthropocentric image the infinite zero – the void of subjectivity and the black hole of the face – is lost in overly 'present' presence, whereby the absence of the subject is constantly deferred into the line of history. It is this characteristic of the gaming avatar that limits the creative expression of the subject, no matter how many varieties of '+1 Mace' one may own.

3.2.3 THEATRE OF SUPERPOSITION

We might view the arena of collision, where infinite 1 and 0, physical and digital self, consciousness and the unconscious meet, as Deleuze's theatre of repetition:

In the theatre of repetition, we experience pure forces, dynamic lines in space which act without intermediary upon the spirit, and link it directly with nature and history, with a language which speaks before words, with gestures which develop before organised bodies, with masks before faces, with spectres and phantoms before characters – the whole apparatus of repetition as a "terrible power" (Deleuze 2004a, 12)

This theatre is the space of the subjective Real, the void-function of consciousness. This place, where the void beyond conscious thought is made manifest, is a non-place that underpins our engagement with both physical and digital worlds, a space of pure repetition, of circular becoming, from which the pre-subjective emerges into specific differentiated expressions of the individual. We are thus living always in superposition with ourselves, placing specific worlds over our internal realm of expression, our uncontrollable 'meta-self'. This core of the subject is made manifest through the lines of desire in the Virtual, the abstracting processes of consciousness creating a quasi-mathematical structure, what Tegmark labels "abstract entities with relations between them" (2007b, 102), formed of reason and of thought. Bohm's conception of thought as partial (1994, 61) and participatory (*Ibid.*, 5) gives the superposition of infinities a functional role of negotiating embodiment as an external *objet a* of the subject. This is an innate step towards the cyborg subject as a technological posthuman (although perhaps, here and more generally, a cognitive superhuman), which seeks to create what Nick Bostrom and Anders Sandberg conceive as "intimate links between the external systems and

the human user through better interaction...less an external tool and more of a mediating "exoself"...embedding the human within an augmenting "shell" such as...virtual reality" (2009, 320). Yet this state of superposition is not merely applicable in a digital environment, for the same Virtuality is present in the physical world. The embodiment of the subjective void is always a 'shell' of augmentation, be it a sensory or abstract construct, allowing for interaction with a world through the 'collapse' of the mediated subject into such a world.

3.3 OBSERVING FRAGMENTATION ACROSS WORLDS

3.3.1 PARTICIPATING IN PIECES

The gaze of the engaged subject and its superposition between infinities raises interesting questions about the fundamental nature of observation, in both physical and digital worlds, particularly when applied to the active perception of the self-as-Other in the form of an avatar. In separating the role of engagement within observation, Heisenberg pronounced that "classical physics, therefore, has its limits at the point from which the influence of the observation on the event can no longer be ignored" (in Nobel Foundation 1965, 299). It is this influence that is key to the problems tackled through quantum mechanics, seeking to delve beneath the illusion of macroscopic certainty, to confront the fact that "this [coherent] sense of the reality of objects and things is *constructed*" (Bohm 1994, 109). Bohm demonstrates the importance of thought within such a reality, in a reciprocal interaction of perception whereby, "instead of saying 'an observer looks at an object', we can more appropriately say, 'observation is going on, in an undivided moment involving those abstractions customarily called "the human being" and "the object he is looking at"'" (2002, 37). In the digital realm, this gains further significance, as visual and cognitive engagements take on mutual uncertainties. Bohm tells us that "thought is *incomplete*...a signification, or an 'abstraction'...thought provides a *representation* of what you are thinking about" (1994, 92) and, in the same function towards consciousness, the avatar – the digital manifestation of the observer-as-observed – becomes a 'representation of what you are representing', a simulation-of-simulation in the subject beholding itself as object. The digital world commonly appears as a reflection of the physical world in a manifestation of an ideal. Heisenberg confronts the abstract constructs of such an illusion, in which "the physical world differed from the ideal world conceived in terms of everyday experience", resulting in the problem that "ordinary concepts could only be applied to processes in which the velocity of light could be

regarded as practically infinite” (1949, 62), placing an ideal notion of limitlessness on the very functioning of scientific measurement. However, there is no light *within* the digital realm, merely in its expression, its mediation-embodiment. It is only an ideal abstraction on the part of the observer that generates the relevance of light calculated simultaneously in the digital world, in contrast to the integral role of light in initiating a physical ‘observation’ in its most abstract sense. The observable digital world and the observable digital subject create their own embodiment through the inherent abstraction of code and its cognition.

Through the fragmented abstractions of perception and thought, there is thus an inherent limit to the embodiment potential for avatars as forms of expression, themselves embedded in an established ‘computer culture’ of interaction. For example, Nicholas Earle’s research proposed a “set of states and gestures” (2001, 171) for augmenting avatar communication that not only includes the examples expected for an expressive embodied avatar – ‘sleepy’, ‘laughter’, ‘sad’, ‘kiss’, etc. – but also an ‘unavailable’ state, as well as ‘emphasis’ and ‘thinking’ gestures. These extra motions add an array of embodied hypertexts to the figurative avatar: the ‘unavailable’ state, echoing the lolling ‘afk’ [away from keyboard] position in SL and other similar signifiers of gestural absence, maintains the states that govern social interaction on a purely textual basis (such as messaging software and chat or forum websites); an ‘emphasis’ gesture portrays a common html tag as a visual gesticulation; and the ‘thinking’ gesture recalls the eternally frustrating timer icon or spinning coloured disc that forms a baleful signifier to any impatient computer user.

These hypertextual fragments of ‘presence’ display an underlying need for an expanded view of participation in avatar-mediated environments, for even the most ‘realistic’ never suffices for a genuinely digital existence. The HUD [heads-up display] that re-frames any digital environment maintains the subjective position between embodiments, regardless of the level of immersion. This need to be present through contact with information leads us to uncover the potentiality of an art practice in which avatars participate *as* data, fulfilling the need to progress beyond a replication of physical embodiment. The work of avatar Angrybeth Shortbread (and her physical counterpart Annabeth Robinson) displays such a practice, whereby the subject is fragmented into individual values of data, through which the art work can be engaged and observed. The interactive installation *Avatar DNA* (2006) uses an avatar’s UUID (universally unique identifier) to convert the presence of the avatar into pure data, a string of hexadecimal characters, which generates a double helix akin to biological DNA. In the artist’s words: “the sculpture generated is as individual as the avatar themselves” (Shortbread 2006a). However, unlike physical DNA, this individual code does not define the outwards appearance of the avatar, it is a pure signifier, an abstract data point. The

temporality of each construction ties together the presence of the avatar both visually, embodied in the gallery space, and as data, in its brief existence as 'DNA'.

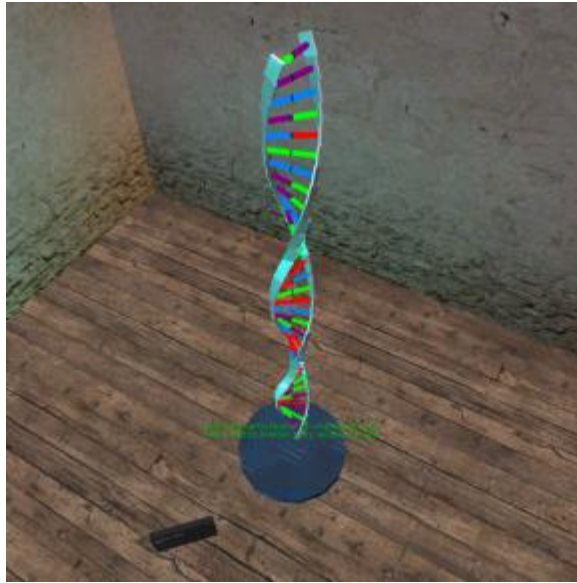


Fig.19 Avatar DNA (2006) Angrybeth Shortbread
The Avatar's UUID is converted into a double helix representing a digital interpretation of genetic code.

This principle is furthered in the sonic medium, and split into its two constituent elements of expression, in the works *UUID Polyphony* (2006) and *I am Note, We are Music* (2009). The former continues the avatar-as-data by converting the UUID of approaching avatars into musical phrases stored in four playback devices which continually cycle through the musical memories of the avatars that have been present, re-asserting their presence as data in their visual absence. The latter focuses on data directly relating to visual presence, with the height and position of the avatar converted into the pitch and iteration frequency of the notes played by the 'harp'. The complexity here is derived from the visual presence of many avatars, as a collective performance tool using the flexibility of visual appearance as both data and expression. This collective gesture of presence is echoed in *Gestalt Cloud* (2009),¹³ which generates rain from four or more avatars moving close to one another inside a three-dimensional grid. This rain brings to life a digital garden to be explored, though the presence of the avatars in the garden, and their resulting absence from the grid, leads to a slow fade into the original darkened state. Here presence and absence are played against one another in two conflicting spaces of exploration and interaction. This role of presence as absence is further highlighted in *You Demand Too Much of Me* (2006), which involves the non-being of a three-dimensional grid of cubes in relation to avatar presence. This work, which "began with a simply musing, 'Does Art within a Digital Space, exist if its not being observed'"

¹³ See <http://www.youtube.com/watch?v=ZIDdJXVxLc> for video.

[sic] (Shortbread 2006b), inverts the expected interactivity as it “decays whilst it has an audience...a visual metaphor for consumption” (*Ibid.*). The greater the collective of avatars present, the more quickly this work ‘decays’, evoking the observational ‘consciousness causes collapse’ hypothesis and the inherent paradox of subjective presence in the digital (indeed any) world.

3.3.2 WAVE/PARTICLE DUALITY

The problematic relation of observation and thought is played out perhaps most fervently in Heisenberg’s uncertainty principle and the wave/particle duality. This was initially a conceptual dilemma for thought: “the dual characters of both matter and light gave rise to many difficulties before the physical principles involved were clearly comprehended” (Heisenberg 1949, 78). The two modes of being present in the basic quanta of the physical universe, as particle and as wave, lead directly to our cognition of such a universe, wherein “not all physically significant observables can be determined together” (Bohm 2002, 85). The implications of this principle, that “the exact knowledge of one variable can exclude the exact knowledge of another” (Heisenberg in Nobel Foundation 1965, 299), is founded on the superposition of states (of, for example, electron spin) and, more fundamentally, a superposition of being (matter and energy). This duality of being, in which competing modes of being preclude their competing perceptions, provides an assessment of the superposition of digital and physical selves in the form of the body and the avatar. Just as Manuel De Landa identifies that both “matter and energy have the potential for *self-organization*”...“inherent creativity” (1997, 16), so too do the physical and digital embodiments possess their own underlying drives of creative potentiality. Just as light cannot be perceived simultaneously as a photon and an electromagnetic wave, so too does an engaged subject struggle to confront physical and digital embodiments simultaneously within consciousness.

There are fundamental concerns for both ontology and epistemology at work here, in what reveals itself to be a matter of levels of subjectivity. Heisenberg tells us that “the dualism between the two complementary pictures – waves and particles” is not a problem of “the dualism between two different descriptions of the same reality” but, rather, the matter of “what happens ‘really’ in an atomic event” (2000, 18-19). This is a problem of both the absence of ontological certainty and an inherent lack in our epistemic relation to such a ground of being, based on Heisenberg’s principle that “we cannot completely objectify the result of an observation”, fundamentally a “problem of subjectivism” (*Ibid.*). What Heisenberg’s principle suggests is a disruption to both positivist and realist claims to objectivity, insisting instead on

the absence of any true matter of fact about quantum and subjective realities. This is justified by the fact that it is only the non-observer-dependent uncertainties that might be called 'objective', and that any observation of these uncertainties is inherently 'subjective' as part of our incomplete knowledge. The same applies to consciousness and its expression in physical and digital avatars, particularly when addressing the separate manifestations of the same consciousness. If the underlying uncertainty of consciousness, what we call the void-core of subjectivity, is objective, it is because it quasi-causally defines the *tendencies* of our decisions about our appearance and our actions with such an appearance. By contrast, our *knowledge* of the particular engagement of our appearance in any given world is purely subjective, tempered by a specific incomplete view in one 'collapsed' state. Most physicists, including Heisenberg, Deutsch and Bohm, are constrained by scientific positivism in their desire to "cling on to the philosophical notion of objective reality in itself" (Deutsch in Brown and Davies 1986, 104). In the digital realm, however, and indeed in any creative act, the subjective observation does indeed cause the event of being.

The work of Ian Upton and his avatar Ian Pahute challenges the dual perception of the subject. The installation *The Loneliness of Being* (2008) draws an endless flow of information from internet search engines into a meditative flux of abstract embodiment. An array of words floats in a vast open space, fading and merging as new terms are added, reducing the data to a level only disturbed by observation. The mix of soft coloured letters takes on meaning only in viewing. The avatar can sit beneath the work, looking up into the mass of signification, or fly amidst the endless flow, navigating the space in a data-filled solipsism. The island on which the work is placed is often deserted, leaving the viewer with only themselves and the words for company. The subject is lost between their screen-framed view of the



Fig.20 The Loneliness of Being (2008) Ian Pahute
Words drawn from internet search engines fill the sky around the observer.

installation and their avatar's place within it, transcended by the eternal flow of words that refuses to be fixed in measurement. A second installation, *Shadows* (2008), displays ghostly figures walking endlessly in a circle, echoing both the human form in its spectral digital embodiment and the superposition of the identical figures at each point in the circle. The ghosts are caught in a perpetual functioning drive: acting both as particles, in anthropic mimicry of an 'embodied' form, and as waves, in the identical blurred movements of semi-transparent figures.

The philosophical quandary brought about by wave/particle duality, exemplified in the simultaneously static and fluid embodiments of subjectivity, is complicated by Heisenberg's resistance to "the ontology of materialism...the idea of an objective real world whose smallest parts exist objectively" (Heisenberg 2000, 83) which grounds much criticism of the Copenhagen Interpretation and which, he states, is impossible in the wake of quantum theory, despite the fact that "Bohm considers the particles as 'objectively real' structures" (*Ibid.*). This appears to be an epistemological problem: Heisenberg rejects anti-realism in philosophy but supports it in science; Bohm rejects anti-realism in science but supports it (tangentially in an emergent manner) in his philosophy, for in Bohm's theory "there will sometimes not even be matters of fact about *what observers think*" (Albert 1992, 179). These conflicting levels of subjectivity further highlight the duality of fixed particle and functioning wave within the structures and disciplines of thought itself. It is here, with a negotiation of expression and an embracing of the subjective, that it is idealism that must be asserted in order for a critical culture to interject between the dualities of reason, for "art is always an idealization; the ideal is different from reality...but idealization is necessary for understanding" (Heisenberg 2000, 65). The underlying subjectivities must necessarily be confronted in expression across multiple conceptual and ideal spaces for a greater understanding of the ruptures within gaze and thought.

A further work by Upton, undertaken in collaboration with Steve Wilkes, converts the physical body in space to an idealised representation in data. *A Passing Moment* (2007), involving the use of visual and spatial scanning technology, forces the 'misuse' of technology into a discussion of absence and presence in human interaction. The scanning equipment, able to create a millimetre-accurate render of a three-dimensional physical space, is disrupted by movement, leading to gaps and glitches in the scan. By inviting a physical human audience into the space during the scanning process, the human subjects themselves are transferred into thousands of data points, while their movements create absences within the digital model. The very presence of humanity interferes with the measuring apparatus, demonstrating a wave/particle duality at the heart of the subject-as-data. These images are

exhibited in SL, creating a direct confrontation between the physical body as pure data and the purely digital human as visual body. In the artist's statement to *A Passing Moment*, Upton explains his interest in such disruptions of constructed observation:

The line between chaos (our sensory and subjective view of the universe) and the void, that unknown area inside (our spirit, soul, unconscious) is a fascinating one. I would argue that we consciously and proactively construct our universe...constantly shifting, breaking and transforming as new ideas are discovered and old ideas challenged. It is this line, the conscious construction, that much of my work seeks to explore. (Upton in Upton and Wilkes, 2007)

This demonstrates an awareness not only of the void of subjectivity, but the construction of worlds around such a subjective reality, which the work meets with expression as the ghostly digitised figures form avataristic echoes. The physical form here is the *objet a*, the lost object filled with the excess of data as it is reduced to a quantised render. The wave collapses into particles as the observer regards the captured moment; the energy of the living reduced to the sepulchral stillness of memory.

3.3.3 CONSCIOUSNESS OF SUPERPOSITION

States of superposition, before observational collapse closes the potentiality of the two infinities, enables what Albert labels new "modes of being...which are quite unlike what we know how to think about...*extraordinarily* mysterious situations" (1992, 11). To Heisenberg, the largest breakthrough since Newton was Bohr's probability wave, that "introduced something standing in the middle between the idea of an event and the actual event, a strange kind of physical reality just in the middle between possibility and reality" (Heisenberg 2000, 11). The inaccessible possibility staining our perception in the centre of reality, the mysterious state of superposition, is instructive to digital culture. Within the digital medium, where potentiality is formed from bits rather than wave functions, the same two states (in infinite variation) can produce infinite outcomes. However, similar processes occur in either actualisation. An observation could be simply stated as "one possible solution to a giant cosmic anagram" (Egan2010, 160). The infinite permutations of this 'dust' (be it fundamental particles or bits) could potentially and atemporally result in either digital *or* physical worlds, in a digital *or* physical subject. The notion that the same Real underlies both realms highlights the confusion in identifying with any singular physical or digital embodiment.

The progress of humanity is leading towards an increasingly hybrid manifestation of consciousness, around the void-core of the subject in superposition with itself. This is the evolution of the cyborg subject. As the distinctions between the physical and digital human are ever blurred by the developments and ubiquity of technology, this state of superposition already has profound implications for the future of humanity. Bostrom furthers his discussion

of augmentation that we have seen above with a consideration of whether our entire reality, or its appearance as physical reality, is in fact a computer simulation:

A technologically mature "posthuman" civilization would have enormous computing power. Based on this empirical fact, the simulation argument shows that at least one of the following propositions is true: (1) The fraction of human level civilizations that reach a posthuman stage is very close to zero; (2) The fraction of posthuman civilizations that are interested in running ancestor simulations is very close to zero; (3) The fraction of all people with our kind of experiences that are living in a simulation is very close to one. (Bostrom 2003, 255)

Therefore, located between the extremes of posthuman success and failure is argued a near certainty that the currently perceived physical world of Real-Existence is in fact already a Virtual-Existence of a computer simulation. Between the infinite one of utopia and the infinite zero of nihilism is the superposition of consciousness balanced equally in physical and digital perception, differing only in the manner and construction of its engagement.

3.4 SECOND LIFE ART

3.4.1 AVATAR AS OBJECT

In relation to standard tropes of avatar-mediated computer game environments, 'nongame' virtual worlds such as SL appear as Deleuze's ideal game: "without rules, with neither winner nor loser, without responsibility...this game is reserved then for thought and art" (2004b, 63). This manifestation of the ideal renders the structures of fantasy, desire and drive before us in the subject as object. The avatar occupies this space as the stain within the screen, filling the virtual environment with the subject in a manipulable and problematic form. In such a cyberspace, Žižek identifies three psychological 'disorders' that are of relevance to the avatar as an object of the mind: perversion, the "permanent reshaping of one's symbolic identity"; psychosis, our "incestuous immersion into the screen as the maternal thing"; and hysteria, in the "permanent questioning...[of an] anonymous other" (2009c, 294). While these can be applied to our interactions with any digital object or digital other, when that object/other (as Lacan's *objet a*) is the subject itself, a number of additional interactions are brought into play within the construction of subjectivity. This is best demonstrated in the simultaneous perversion, psychosis and hysteria of numerous art projects labelling themselves 'Avatar Portraits', raising the image of the avatar to the level of a consumed yet revered object, a totem in our digital existence.

These include not only Schomaker's work, but also, notably, that of radical collective 0100101110101101, whose exhibition *13 Most Beautiful Avatars*, part of the larger project *Portraits* (2006-7) based on images of avatars, also brought the avatar-as-object across the physical-digital divide. The images of SL avatars, not including those of the duo, were shown both online, on the collective's website and in an SL art space, and physically, as canvas prints in a New York gallery the following year. While the creation of anthropocentric avatars could suggest a representational and figurative digital art form, this occurs in a postmodern twist of realism in digital culture that Jameson describes as "a realism of the image rather than of the object [that] has more to do with the transformation of the figure into a logo than with the conquest of new "realistic" and representational languages" (2003b, 701). The apparent return to 'figurative' portraiture in the Mattes' avatar portraits therefore falls into the mediated transformation of form into logo while critiquing the consumptive imagery that it creates. The clean and crisp images – of anthropic avatars of both sexes – "exude a sexy artifice that is both seductive and a parody of seductiveness" (Smith 2007). This reappropriation, which comes to "signify emergent aesthetic values of *Second Life*, and remediate pop art modalities of the fallacy of "portraiture" through digital culture" (Dinnen 2012), disrupts the traditional portrait: visually, by the faces over-filling one side of the image rather than being centred neatly within the frame; conceptually, through the absence of human identity even in these anthropic characters. The objectification of the avatar not only mimics the familiar objectification of the human form in popular media, but projects such a critique of objectification onto all forms of portraiture, levelling the reverence for the human face with its digital, malleable, anonymous counterpart.

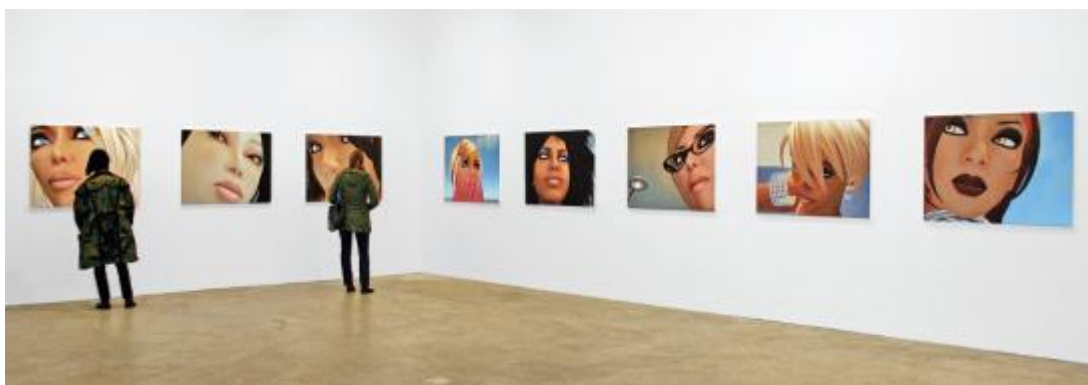


Fig.21 Portraits (2006-7) © Eva and Franco Mattes
Avatar faces overfill the portraits presented in a physical gallery.

Of further interest in challenging the fetishistic status of the human form is the work *Synthetic Performances* (2009-10), which offers a similar critique to the bodily orientated performance art practice. Of the work, Mattes says: "we hate performance art, we never quite got the point. So, we wanted to understand what made it so un-interesting to us" (Mattes

2007). These SL performance re-enactments use avatars that resemble the Mattes as closely as possible. Their art practice in the physical world, based on forgery and imitation, has led the artists to attempt to be 'themselves' amidst the freedom of choice in digital environments. Interestingly, this point perhaps reveals more about the artists' construction of their own subjectivity than their critique of performance art: their physical identities are so often shrouded as imposters and fakes that their bodily forms have become, artistically, a lost object even to themselves. In this context, the focus on clear and accurate images of the avatar faces in their portraiture can also be read as a need to utilise the avatar-as-object to reclaim the *objet a* of their physical world creative subjectivity.

The avatar as contemporary digital figuration is only an object in the sense of loss, as a purely coded emblem of data standing in for the Real of subjectivity we wish to express through it. That is, the avatar as an art object can only be an art of the *objet a*. These lost, partial (or virtual) objects, in terms of the avatar-as-object, function for the rupture in Virtual-Existence of the subject's own gaze. Deleuze states that "whatever the reality in which the virtual object is incorporated, it does not become integrated...but rather testifies to the other virtual half which the real continues to lack" (2004a, 125). Jameson identifies this lost object as pure signifier or 'logo', expressing a "new kind of abstraction" (2003b, 703) not only characterised by postmodern art and culture but embedded within the very structure of cyberspace. The Real Meaning bursts forth in our frustration of the avatar as object, confronting our Virtual Existence with its precise, structured discourse of computer code. A further consideration regarding the role of the avatar as art object is presented by the avatar Kisa Naumova (and physical counterpart Graham Hibbert) in defining art in SL:

There is no Art inherent to Second Life...Every texture of something Other on a prim demands the viewpoint of a frame within a frame...the ultimate Suspension of Disbelief - that our Avatars are 'us'...Art in Second Life lies - not within the scripted animation, or the tortured prim - but within the one true item that we have unconditional control over - our *selves*.

To see Art in Second Life is to see others. To create Art is to Be here. The translation of Real Life artifacts into the Virtual Space...is forever futile...the only commonality between it and that that we normally occupy is our *selves*.

There is no Art. There is only Avatars. (Naumova 2009)

This artist's statement voices some key issues underpinning avatars *as* art, and the user's interaction with other art objects in SL through an art object itself. If creation is being in the digital realm, the avatar is necessarily a 'stain in the gaze'; a mark of subjective expression and a subjective interface with Virtual Existence. To achieve constructive consciousness of one's own mediation requires that such an interface be under the influence of the subject, thus the avatar-as-object presents a tool for both expression and interaction, as well as a direct opportunity to confront our formation as subject within digital culture.

3.4.2 AVATAR AS EXPRESSION

As is the case with any mediation, expression in avatar-mediated spaces such as SL is a matter of a series of limitations. If “a whole provides its component parts with *constraints and resources*” (DeLanda 2006, 34), then the avatar emerges with a set of limitations applied by the ‘meta-self’ upon any individual expression of embodiment. The specific form taken by the subject, particularly in realms such as SL, are governed by a complex set of constraints, both external and internal. The basic construction of an avatar in SL starts from a set of anthropocentric choices. While height, figure, colour and clothes are all transfinitely customisable, the enforced presupposition is that the subject will seek a ‘human’ counterpart in this digital realm. An ‘invisible’ skin, however, allows for the construction of any form of expression for the avatar to ‘wear’, creating an assemblage of the imagination. One such embodiment in SL was Cory Linden’s Flying Spaghetti Monster, influenced by Janssen’s *Touched by his Noodly Appendage* (2005):

Cory Linden is likely the only person who knows where the ends of the Spaghetti Monster’s many strands are actually hidden, such as to disentangle them – the Spaghetti Monster, of course, being a metaphor for the code of Second Life – “almost organic,” as one of the programmers put it. (Fitzpatrick 2007)

This anti-anthropocentric avatar by one of the lead engineers of SL, a key designer of the Linden scripting language, displays the potential links between code and creativity as two expressions of the Real.

Many saw the departure of Cory Ondrejka (the physical counterpart to Cory Linden) from Linden Labs as a “normalizing” (*Ibid.*) of SL, most notably in terms of the business model moving away from the hardline coder, open source ethic. However, the move also indicates a continuing aesthetic shift. With the pronouncement “The Flying Spaghetti Monster has left the world” (Au 2007), many acknowledged the departure as a step against freer aesthetic vision driven by progress in the code itself. Whilst the Flying Spaghetti Monster was indeed one of the last direct impacts by Linden employees on in-world creativity, it was perhaps more an example of the ‘geek’ aesthetic of obscure cultural references¹⁴ than a theoretical push towards limitless digital expression for itself. Cory Linden’s creative contribution and departure are, however, symptomatic of the tensions between the technology itself, its control by market forces, and the individual creative subject. There are key technological implications of social/art/non-game virtual worlds. For example, “*Second Life*...is a cyberspace simulation, not a game. It emphasizes user-created content. This feature consumes

¹⁴ For example, Cline’s portrayal of the “pale-skinned pop culture-obsessed geek” (2012, 197) in a digital world containing “the collected knowledge, art and amusements of all human civilization” (*Ibid.*, 14).

significantly more bandwidth" (Miller 2011, 78). And, furthermore, the general strain on technological resources is stretched even further with larger worlds:

The most popular DVEs [Distributed Virtual Environments] – such as World of Warcraft and Second Life – limit mutual interaction to less than a thousand of their millions of users. Experiences like full-scale virtual battles and large-scale performances remain far out of reach (*Ibid.*, 113)

The limits of expression remain the technology available, as evidenced by many a colloquial critique of the SL aesthetic and the continued use of stark geometric shapes even amidst more complex renderings by, for example, avatar-artist Bryn Oh.

Yet the limits are not only the technology, for the user also limits their own expression. Just as the anthropocentric avatar constrains the objecthood of the subject in the digital realm, so does the physical configuration of consciousness act as a constraint on the true freedom of expression. With such an attitude in place, such a fundamental structure of fantasy – recreating the physical world according to the individual user's whim – virtual worlds such as SL are at risk of being reduced to what Rem Koolhaas would label "Junkspace...the body double of space, a territory of impaired vision, limited expectation, reduced earnestness" (Koolhaas 2002, 176). As Jameson elaborates, this space elicits, as in Koolhaas's own text, a response that is a "combination of revulsion and euphoria...unique to the postmodern" (Jameson 2003a, 73). Furthermore, this "junkspace virus" (*Ibid.*) is, for Jameson, "the disappearance of all the 'originals' no doubt, but along with them, of History itself", although "it is not quite the 'anything goes' of the new generation of computer-generating 'blob architects'" (*Ibid.*, 75). The free, abstract vision of early 'virtual reality' and the 'extremist geek' attitudes have fallen out of favour amidst the photorealistic aim of mass consumer online capitalism, in the transition towards the reduction of digital environments to both "an escape hatch into a better reality" (Cline 2012, 16) and "a self-imposed prison for humanity...a pleasant place for the world to hide from its problems while human civilization slowly collapses" (*Ibid.*, 120). However, it is precisely this more direct (and perhaps abstracted) expression of consciousness that can divert the junkspace virus: connecting the void of subjectivity with a self-conscious modification. Freedom of expression in SL, as with the digital world as a creative medium in general, is growing ever more dependent on advancing technologies to regress our consciousness of the role of these technologies. As higher specifications of hardware gradually *can* render perfectly whatever we imagine, it seems that increasingly what is being imagined is merely an 'improved' version of the physical world. Criticality itself has become superficial. Across the vast majority of SL, largely a museum of whimsy, we are no longer dealing with the possibility of a cyberpunk fiction, in which Jameson identifies "a mapping of the new geopolitical Imaginary" (2007, 385), and it is only in gestures

that are critical to the medium itself, such as Bryn Oh's installations, that persist in making progress toward a genuinely digital aesthetic and mode of expression that makes contact with the terrifying Real of subjectivity.

3.4.3 AVATAR AS INTERFACE

The process of and subjective relation to avatar-mediation must also be considered. Using an avatar, entering an 'avatar-mediated space', embeds even if it does not embody the subject within the specific digital realm. This draws the subject into the temporality of the environment. In contrast to the atemporal, hypertextual manner in which the subject often engages with the abstraction of the digital medium – in textual situations such as forums, blogs and downloadable content, or standalone single-user interactive works – avatar-mediation forces the subject not only into an alternative three-dimensional world, but also an alternative linear timeline. However, within Deleuze's expanded conception of temporality "time must be grasped twice", both as cause: "the living present in bodies which act and are acted upon", and effect: "an entity infinitely divisible into past and future" (Deleuze 2004b, 5), which in terms of expression, or 'sense', is "skill, understood as the *art of causality*" (*Ibid.*, 59). In placing the avatar as a causal, active tool for interaction (a 'body' in the loosest sense of the word) the subject creates itself between realities as effect, or indeed as affect in its infinite regress into partial objects and simultaneous lack and excess. It is worth noting that the avatar as partial object (*objet a*) also maintains a quasi-causal function, thus creating an (imbalanced) circle of infinite regress through the void of subjectivity, between the Virtual and the Real, mediated by the specific arrangement of Existence and Meaning. It is the self-positing of the subject, and thus subjectivity itself, that constitutes this regress into the void. One artist who embraces such a 'skill' in manipulating causality through the interface of the avatar within SL is Bryn Oh, in her lavish psychological, full-sim installations.

Oh, starting in SL as a machinima artist, is only the avatar, with no connection to the physical artist. As the header of the artist's blog explains, "Bryn Oh is a virtual artist created by a Toronto oil painter", although the relationship has developed reciprocally: "when I first came to SL I brought in first life ideas to work on.. where now I seem to export SL ideas to my first life" (Oh 2013a). While this could at first glance appear similar to the conflation of identified selves in Schomaker's problematic negotiation of avatar subjectivity, there is at work in Oh's construction a more deliberate elaboration on the digital subject and an acknowledgement of different modes and cognitions of creativity in her underlying cyborg self. The artist has stated: "the stories I tell on Immersiva are my own hopes, dreams and fears hidden behind the

mask of robots” (Bryn quoted in Shostakovich 2010), and this is exemplified in her avatar, which disrupts the expressionistic human figure with cybernetics and, eventually, a deformed rabbit-like mask. This image relates to the themes of an early trilogy of large-scale builds and machinima by Oh – *The Daughter of Gears* (2008-9),¹⁵ *Rabbicorn* (2009), and *Standby* (2010) – which, like much of Oh’s work, utilises characters undergoing a transition between human, animal and robot forms, confronting the psychological quandary such a subject might encounter. *The Daughter of Gears* was created for the Black Swan art sim and features art works by avatar Light Waves and others as well as many traps for visiting avatars to negotiate. Oh’s response to this arbitrary use of obstacles in the interaction of the sim initiated the creative drive for her own build: “Why are there traps here? Who are they trying to keep out? There was no narrative so I devised one” (Oh 2010). The series of traps and obstacles amidst a winding, climbing path through a series of poetic interludes and three-dimensional scenes disrupts the narrative through a level of inaccessibility. The struggle of a visiting avatar to reach the conclusion of the story draws the viewer into the narrative through their avatar as an interface to the world of a mother trying to save her daughter by transferring her consciousness to a robot, while avoiding the protests of an angry mob. Even the completion of the narrative ‘quest’ draws the avatar further and more horrifically into the narrative, for “once they reach the top [they] realize that they are one of the mob” (*Ibid.*). The emotional ruptures of the characters in Oh’s work blends seamlessly with the disruption to the visiting avatar’s complicit experience as an interface not only to the three-dimensional world but also to the psychological world of the artist as creative digital subject. This critique of interaction is evident even in the name of Oh’s sim – ‘Immersiva’ suggests engagement as the key element of experiencing the art – and the necessary role of the avatar as interface in experiencing her art forces engagement with a free quasi-linear narrative that creates a wave function of the gaze: “a mobile gaze that is *made flesh* in the *metaverse*” (Ramirez 2012, 120) as a potentiality between many paths, scenes and objects. The builds themselves are filled with hypertextual layering: finding hidden objects, linking to external content, and typing words printed on objects into chat windows; there are many ways to negotiate these environments and reveal their semiotic strands of narrative.

¹⁵ See <http://www.youtube.com/watch?v=CK9wzGATQ4E#t=256> for machinima presentation.

The superposition of narratives, gazes and objects confront the avatar in Oh's later work *Imogen and the Pigeons* (2013), drawing notions of self into a wave function, approaching Jac Saorsa's conception of potentiality in which "narrative identity is always mobile" (2011, 98), here in its incursions through space. Connecting the infinite one and zero like Alice 'down-the-rabbit-hole'¹⁶, in Oh's work the avatar is drawn beyond itself into expressions of the Real in contact with the Virtuality of consciousness. In *Imogen and the Pigeons*, after climbing a disappearing staircase out of the decayed 'Rebirth™ life encryption' wasteland, the stark black and white cuboid stairs are juxtaposed with the expressionistic realism of a therapist (TheRapist)'s clinic housing anthropic characters extended by manifestations of their darkest traumas. The interaction is ingeniously extrapolated, for, by 'sitting' on a feather, a visiting avatar is able to walk on the walls and ceilings of the installation, as the narrative unfolds between the psychological scenes and abstract corridors, that require the extended avatar interface to defy gravity, and conventional conceptions of three-dimensional space. The flexible narrative structure, in what Francisco Ramirez describes as "combinatory paths, multimedia hyper structures, and the provision of a visual *pentagram*" (2012, 135-6), tells of a girl stuck between human and pigeon personae, echoing the human/avatar relationship as the

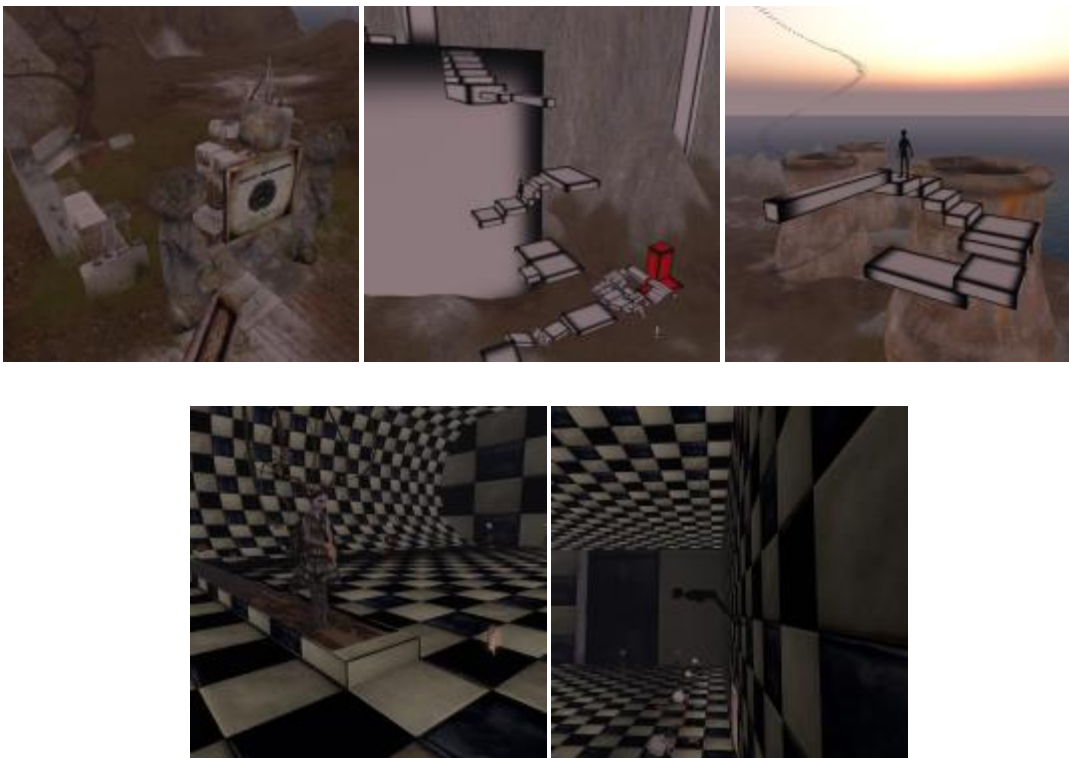


Fig.22 *Imogen and the Pigeons* (2013) Bryn Oh
 Navigating the wasteland of the installation, to reach the nonlinear narrative fragments of psychological trauma and uploaded consciousness, requires negotiating a falling staircase and walking up walls.

¹⁶ This can be referred to Oh's deformed bunny avatar and the mythical robotic Rabbicorn (half rabbit, half unicorn), or indeed to Deleuze's treatment of Alice in his propositional logic (2004b).

human subject seeks to identify with the freer group, to fly with the pigeons. Here the Real at the core of Imogen's subjectivity is constantly seeking to burst forth into a Virtual identification that is furthered by a cybernetic extension of her consciousness. The wave function of the visiting avatar's gaze creates a narrative that confronts the subject with their own split personality. The installation's poetic fragments detail the deterioration of the stored memories and the emergence of a child from these fragments of consciousness, following which Imogen lifts up her memory-child towards a blue whale in the sky, offering a direct comparison between the world of the installation and the broader environment of SL. There is here a moment of confrontation between the physical and digital bodies, and an emphasis on the problematic relationship residing within consciousness of the cybrid subject and, amidst the trauma, the creative acts possible for subjectivity through its interface of a 'body' (of any description, be it human, avatar or pigeon), between the infinite one and infinite zero of existence, binary code and subjectivity.

3.5 BIG A-VATAR

Where does this expanded engagement with the avatar, beyond a simple comparative embodiment, leave the contemporary creative subject? The impermanence of the subject-as-avatar, both in terms of sentient malleability and its obstruction/destruction by other subjects and the medium itself, challenges the position of the digital subject in relation to the physical self that perceives it from the other side of the screen. The apparent separation that the screen itself imposes between the subject and its expression through binary data forces us to confront Žižek's notion that "the lost object is ultimately the subject itself, the subject as object" (2009a, 64). While dominant technophobic philosophers such as Paul Virilio see existence, performance and art in digital environments as merely "the grotesque dance of clones and avatars" (2003, 95), the gaze confronting itself as object in the avatar suggests a greater value to avatar mediation, a critical role for the subject as NPC (non-player character).

The avatar can indeed appear as a detachment of subjectivity, an estrangement of the subject in its objectified self, mediated by the computer screen. However, when the avatar takes on the role not simply as an object of subjectivity but also an expression of the void-core of the subject and an interface through which the digital medium itself can be directly confronted and challenged, a greater understanding of the construction of all manifestations of subjectivity can be achieved. Such a gesture reasserts the position of the gaze itself as *objet*

a (Lacan 1977, 105), the physical body thus also playing the role of object, expression and interface within its world(s). By placing the self as visual, spatial and cognitive other, the detachment of the subject from its physical limitations can allow for more direct expressions of the subjective Real beyond the self-mediation of consciousness. In doing so, the gaze becomes simultaneously the infinite one of presence and the infinite zero of absence, lack and excess in superposition. Only when the gaze seeks to grasp an individuation of the subject does consciousness collapse itself into a body, subsuming the Real under Virtuality.

The superposition of the Real and the Virtual, the *objet a* and the big Other, is thus the fundamental construction or boundary of the self-perceived 'subject'. In analysing the apparent self-negation within Žižek's writings, Denise Gigante describes how a void-based 'critical self' perpetually undermines and redefines itself as "the Absolute posits himself and thereby posits the universe...a "metapsychological work"" (1998, 154). Through the digital medium in general, and the avatar expression in particular, the subject can directly perceive this process occurring, for to enter a given sim with one's avatar is to bring that realm into existence before the subject. The casting of a portion of the self into alternative constructions of the universe embraces the potential of the subject to be 'outside' itself. Badiou states that "one of the names of the Outside is 'event'" (2007, 37), and the creative gesture in such a 'metapsychological' act therefore possesses great force in reshaping a subjectivity that externalises itself, not only in the digital world but also physical and cognitive realms.

The human physical body is an *objet a*, a lost notion of a 'perfectly' functioning construct from which we are ever waning. Not only disability but also old age, temporary illness, situational concentration, and any number of other factors all contribute to the lack inherent in the privileging of the body. Therefore, if the human body itself is a lost object, it is merely the importance placed on it by consciousness as 'my' body that causes the desire for such privilege. As with the continuing discussion of cybernetics, the avatar 'body' as *objet a* displays for humanity an inherent lack and excessive internal reliance on the physical body prior to any engagement with the digital realm. What the digital body – the avatar as objectified subject – offers, is an eventual opportunity within our own gaze of a connected externality of subjectivity. It is precisely the avatar's disconnection from direct (physical) sensory perception that enables the subject to embrace lack and excess simultaneously in apprehending itself as object. Whether the individual subject can reach and overcome this dilemma of otherness is, perhaps, an entirely different matter.

Thus we must consider what is at stake, the risks of such an approach. If the avatar can support an expression of the Real from the inaccessible heart of subjectivity, and allow such a

subject to interface with itself in the gaze of its otherness, then the avatar can also suppress such an expansion of the 'embodied' subject. Lacan tells us that "it is in the space of the Other that he sees himself and the point from which he looks at himself is also in that space" (1977, 144). Therefore the subject engaging with itself objectified as digital Other must ascertain what manner of Other its digital self embodies. The innate tendency of the self-as-other, particularly within the inherently solipsistic digital world, is for the avatar to function merely as "the fiction of the big Other that enables us to avoid the horror of being alone" (Žižek 2012, 116). We might consider DeLanda's assemblage theory in the dynamics of control within a subject and its (physical and digital) avatars, whereby "in all assemblages possessing a command structure, the expressive role is played by those components involved in legitimization of authority, while the material role is played by components involved in the enforcement" (2006, 87-8). What this amounts to, in terms of the avatar in the role of big Other, is a negotiation by the subject between its 'embodiment' as an expression of and support for its authority over its own subjectivity, a creative control over selfhood, and its 'embodiment' as a concrete structure enclosing the subject within its own virtuality of authority, the self-positing dominance of consciousness over itself.

However, the response to the dangers of such a potentially oppressive structure, when the big Other of consciousness begins to dictate the actions of the expressive void-core of subjectivity, should not be to simply return to the 'reality' of the physical world. Far from the 'lesson' of much fiction and theory on the subject¹⁷, which is limited by the privileging of physicality, it is through an embracing of the transitory state *between* worlds that insight into either (or both) might be achieved. This approach requires the subject to maintain a general stance of indifference towards one's avatar, supporting a conscious withdrawal from the superpositioned state across two 'bodies'. Žižek insists that "one should withdraw from being immersed in a situation in such a way that the withdrawal renders visible the "minimal difference" sustaining the situation's multiplicity, and thereby causes its disintegration" (2009a, 129). The minimal difference, the key interaction of the Virtual and Real functions of consciousness, is thus observed and embraced through the eventual repetition of withdrawal. If the avatar is held always at a distance within the gaze, observed only as potentiality (as wave function rather than definitive 'particle' of identity), then maintaining the formal antagonism of consciously collapsing consciousness into its embodiments makes possible an awareness of the superposition and parallax gap of realities.

¹⁷ Including Cline's *Ready Player One* (2012), in an ending that reduces the digital to a psychological cure, a limited view of the digital that appears also in Žižek's task of staging and traversing the fantasy.

3.6 CONCLUSION

This chapter confronts the privileged relation of human subjects to the physical over the digital, a nostalgic extension of our biological origins that frames the construction of our cyborg functions, limiting our engagement with digital technologies. This discussion is directed at the physical body and its role in defining the creation of digital expressions of the subject, most notably through the anthropocentric avatar as a placeholder in digital worlds. This parallax shift between our familiar body and its representation in a world on the other side of the computer screen reveals a loss of embodiment in the construction of digital identity. The avatar body thus appears as an *objet a*, a lost object always missing some aspect of humanity compared to our physical self. However, in turn this reveals the physical body as an *objet a*, through its own frailty and comparison to the ideal forms that can be staged in cyberspace. Embodiment must therefore be challenged in this manifestation of the subject as lost, towards a disembodiment in presence-as-absence that might allow consciousness to move freely between forms. Extrapolating this through Deleuze's conception of difference and repetition, and the notion of faciality, examines the functions that construct identity in and between physical and digital worlds. The repetition of loss, as objectification of the void in the Real, conflicts with the Virtuality of difference in the self-positing of consciousness within an engaged world, whether physical or digital. The mode of engagement has been further scrutinised through modes of observation in quantum physics, developing the fragmentation of reality and the wave/particle duality in the necessary ontological difficulties of a subject moving between conceptual spaces and modes of Existence. Second Life provides an instructive and creative space for this reconstruction of avatar forms: as object, specifically the *objet a* and placing of the subject outside itself on screen; as expression, in the development of extended embodiments beyond anthropocentric representations; and as interface, in the extension of visual and participatory tools for engaging with a given reality. From this theoretical development of the avatar, and the process of shifting consciousness between bodied forms opening a critical space of disembodiment in between the parallax of physical and digital worlds, a warning has emerged of the avatar not only as *objet a* but also big Other. Any body we inhabit will frame a world and structure our desires for engagement with it. The necessity for a critical removal from these structures of desire is the focus of the following chapter, which challenges the computer game medium and its regimes of living and dying in the parallax between our physical form and its representation on screen.

4 THE UNDEAD SUBJECT VIRTUAL MONSTERS IN GAMES

This chapter expands on the relation between the Virtual and the Real in more detail, examining the structures of fantasy that sustain their interaction within the smooth functioning of consciousness. The Real is explored further in Žižekian/Lacanian terms as the death drive, while the Virtual is positioned as life in the perpetuation of consciousness by itself and the production of desire. In the interplay of desire and drive, life and death, the Virtual and the Real, there opens a space for symbolic death. This staging of a state between two deaths (the symbolic and the actual) is identified by Žižek most clearly in computer games, whereby there is a split between individual lives and the finality of losing the game. Beyond Žižek's staging of this phenomenon lies a tool for a critique of mediation in sustaining the Virtuality of life. This is both a critique of the computer gaming medium, with its objective-based structures of desire that construct the completion of the game as a fantasy to the player, and also a critique of consciousness, in the Virtual function itself that perpetuates the smooth functioning of consciousness in concealing the rupture of the Real as the incomprehensible and terrifying heart of subjective parallax.

To interrogate these structures of Virtual desire in relation to undeath, Deleuze and Guattari's term 'becoming' is extrapolated from their becoming-animal towards a conception of becoming-death, as a perpetual movement of death drive with an unachievable end. The player-character relationship between human user and on-screen avatar is expanded in the role of the sorcerer and the demon in the process of removal from human society into a state of becoming, which is undeath. The ability of the player to perceive this split, and the staging of its own death in general, is assessed in terms of the quantum immortal, developed by Tegmark from Everett's 'many worlds theory'. The premise that for every deadly situation one version of the subject survives while its counterparts in alternative universes die holds a fundamental problem, that of being able to observe this state of immortality. In the digital realm, and the gaming medium in particular, this is no longer an obstacle, and the analysis is applied to games that stage this death and immortality in full view of the subject.

These relations of death and life, of Real and Virtual, are drawn together in a study of Valve Corporation's *Portal* series, where the protagonist is reanimated after each death in a state of constant (and perilous) scientific testing. This enforced immortality is imposed by the

series' antagonist, the computer monster GLaDOS, whose own structures of desire and fantasy surrounding mortality and undeath are analysed in the context of a disruption of Virtual and Real. This discussion focuses not on the functional gameplay of the technology in itself but rather its relation to the narrative in drawing, constructing and staging a critical alternative world within the game, prefiguring the discussion in chapter 5 of representations of digital culture and technology in fiction and their critical relation to the present. This chapter concludes with a reconsideration of Žižek's staging and traversing of the fantasy in cyberspace, moving beyond a curative use for physical human subjects towards a critique of the fantasy of the digital itself and relations of desire and drive in the cyborg subject across the perpetuation of life in physical and digital worlds.

4.1 MONSTROUS UNDEATH

Since William Gibson's *Neuromancer* (1995a, 10) introduced the term in 1984, 'cyberspace' has been a realm of the undead. Ghosts haunt that spectral domain, challenging the role of the physical subject within such a non-place. When we enter the digital realm, when we cross through the looking glass of the interface screen, we see ourselves as such a ghostly apparition, an undead monster capable of things beyond our mortal frame and beyond our surface level consciousness. What does the unleashing of our subconscious and even unconscious desires reveal about our monstrous self? How does death and undeath disrupt our relation between physical and digital modes of reality?

Digital culture provides abundant examples of its fascination with the interplay of death and undeath, yet the drive is always towards the finalising act of death, as if it is too horrifying to truly confront the potential for lingering undeath that, as we shall demonstrate, is inherent in cyberspace. Examples in blockbusters such as *Tron* (1982) and *The Matrix* (1999), in which death within the computer has equally deadly effects in the 'real' world, reveal an underlying fear of the persistence of our digital selves. In mass media it would appear that we cannot accept the cyber-immortality on offer. We must instead look to more creatively and critically disposed expressions of mortality, such as the "erotic ballets of death" (Sawyer 2011) in short films *458nm* (2006) and *Loom* (2010) by Polynoid,¹⁸ for a true embracing of the moment of death as a state in itself. The proliferation of recent conceptual independent art games instead provides an approach to confronting the immortal virtual monster. The gaming

¹⁸ See <http://www.polynoid.tv/458nm/> and <http://www.polynoid.tv/loom/> for videos.

medium itself has always been constructed around life as a currency – *Rez* (2001) even features lives as evolutionary stages of the player’s avatar, expanded in *Spore* (2008) to encompass the evolution of entire species – and analysis of several art games that confront notions of death and persistence uncover the nature of the virtual monster, but we return to mass media in examining the characters of the *Portal* (2007; 2011) series for the interaction between computer and human as two incarnations of such horror. These two forms are revealed as fundamentally linked and two manifestations of the same monster, physical and digital expressions of the subjective void through the parallax of the gaming medium.

However, Virilio, in his perpetual scepticism of digital technologies, warns us of the dangers in contemporary media of “mere ‘monstration’, a show, a blatant presentation of horror” (Virilio, 2003, 50), and the importance of ‘demonstration’ in both aesthetics and ethics. There is a need in the interaction of the Virtual and the Real to move beyond a simplistic staging of the fantasy that supports the construction of consciousness, towards a genuine disruption of the functions of consciousness in the space between the Virtual and the Real, between desire and drive, between life and death. We can draw from this the necessity of staging an ethical act, which we shall see Žižek describe as suicide in spite of oneself, and through which the role of the undead subject can reveal and maintain the monstrous core of human subjectivity.

4.1.1 BETWEEN TWO DEATHS

Rancière’s analysis of contemporary spectatorship and visual culture tells us that “fixing in the image signifies death’s grip on the living” (2011, 113) and Virilio laments a similar yet inverted notion in which “the dead today dance and sing thanks to the recording process” (2003, 82) and through digital technology we can call forth the spirits of the dead to perform instantly before us. Death is here intrinsically linked to the digital world. In death, the living are reduced to a visual representation: frozen images stored on servers across the world. Facebook, for example, would in Rancière’s framework comprise a vast record of obituaries. Conversely, the wealth of audio and video files available through Spotify, iTunes or peer-to-peer file-sharing brings the dead into a performative re-animation. This use of technology is seen in the advert *Chauffeur* (2013) by Framestore for Mars that renders a computer-generated Audrey Hepburn mask over lookalike actresses’ faces to promote a chocolate product. It is also worth noting that the advert’s copyright notice includes Audrey Hepburn™ under the ownership of her sons, a virtual inheritance of their mother’s identity and control over her digital raising from the dead. The deceased is here brought back into a state of undeath as a technological

puppet, a demonstration of the manner in which digital spectacle thus surrounds us with 'dead' images. Amidst such media, only the spectator remains living, watching (Rancière, 2011, 86). However, by moving between worlds and entering the digital realm, appearing as a character or avatar on screen, the engaged spectator enters into a state of undeath, creating a new mode of existence: symbolic death as part of life.

Žižek describes the 'living dead' as a monstrous 'Thing' that is part of, yet excluded from, the subject (2006, 157) as the traumatic Real, and stages in computer games a state 'between two deaths': "between the death in which I lose one of my lives and the ultimate death in which I lose the game itself" (2008b, 150). To be dead is to be the same person without life, to be undead is to be life without the same person, that is, a desubstantialised subject freed from symbolic ties. We might see the 'immortal' and 'indestructible' core of the subject as the repetition of the void persisting outside of ourselves in the digital realm, the kernel of desire that is unleashed through the interface screen. The 'delete' button thus acts as the stake through the heart of such a monster, although we must sacrifice a symbolic part of ourselves in the process. This undead suicide, barring the subject from itself, forms the very basis of the digital symbolic sacrifice. For Žižek, "the symbolic act, the act precisely as symbolic, *succeeds in its very failure*" (2006, 44), and in the symbolic death on screen we are able to approach the "paradox of a fantasmatic element, which the more it is annihilated in reality the stronger it returns in its spectral presence" (*ibid.*, 236), allowing us to strip ourselves of content and expose in our fundamental fantasy the kernel of our monstrous desires. The cyber-subject, between digital and physical existence, can thus 'traverse the fantasy', what Žižek delineates as to "externalize/stage his or her fundamental fantasy, and thus gain a minimum of distance towards it" (in Wright and Wright 1999, 122). Our digital relation to modes of undeath can function as a Lacanian 'authentic act' and a useful step towards confronting the internal antagonism of the void of subjectivity.

Such acts may seem ultimately self-destructive but if, as Badiou suggests, "inexistence is retroactive" (2005, 409) then we can justify Žižek's suggestion that "destruction itself acquires a form...not simply the absence of form, but the form of (the) absence (of the erasure of the previous personality)" (2011, 296). The digital second death is both destructive and creative: we annihilate our current self in order to return to the physical world renewed, rising from our undeath into new life. In this way "*the subject is as such the survivor of its own death*" (*ibid.*, 307) and the 'cure' of the digital reveals its full potential for the continued development of the subject. Žižek writes, "recognition-through-repetition presupposes necessarily the crime, the act of murder" (2008b, 65), and the process of suicide-undeath-reliving, which is always-already a repetition, is essential in the subject accepting its digital image. The

proliferation of zombie style monstrous hordes as a common foe to vanquish in 'survival horror' computer games¹⁹ and the portrayal of the subject-protagonist as potentially immortal with its currency of lives, displays the "return of the dead [as] a sign of a disturbance in...the process of symbolization" (Žižek 1991, 23). The destruction of these 'enemies' to complete the game is a return to the symbolic order, while games that avoid such finality of achievement²⁰ reveal the subject itself as the monstrous disruption to order and transcendent consciousness beyond symbolisation. Without a nihilistic affirmation we cannot sincerely enter the digital realm to discover a new fragment of truth about ourselves: it is necessary to experience ourselves as monsters in order for the subject to re-centre/re-substantialise its physical self and allow its humanity to emerge. In the relation of Virtual and Real within consciousness, in the structures of fantasy that support and conceal the smooth functioning of the subject, this carries across physical and digital worlds for, as Žižek insists, "we all *are* zombies who are not aware of it, who are self-deceived into perceiving themselves as self-aware" (2012, 122). In staging this through a digital undeath, we are thus confronted with a paradox: our frail, mortal, physical bodies endure beyond the digital symbolic death while our spectral, immortal, digital embodiment dies over and over again; and a question: where, then, is the subject situated between what Žižek describes as two "existential attitudes" (2009c, 169) of (physical-mortal) life and (digital-symbolic) death?

4.2 BECOMING-DEATH

4.2.1 BECOMING-ANIMAL/-MONSTER

The relation of death to the construction and potential overcoming of the fundamental fantasy is intrinsically linked to the formation of consciousness. The Real of human subjectivity, the Lacanian drive that forms the lost object cause of desire, is the objectification of a void at the heart of consciousness. This function of the void manifests as the abyss of death, contrasted to the desire of the Virtual that forms the continuation of life. Deleuze expands upon (Freudian) psychoanalysis in relation to the death drive, in explaining the notion

¹⁹ For example *Resident Evil* (1996), *Half-Life* (1998) or *Dead Space* (2008), taken to a culturally self-referential extreme in *I MAED A GAM3 W1TH Z0MBIES 1N IT!!!1* (2009).

²⁰ Examples of survival games without ends include variants on builder games [*Minecraft* (2009)], MMORPGs [*World of Warcraft* (2004)], or the loops built into many traditional arcade games [*Pac-Man* (1980), *Tetris* (1984)].

of repetition, which may be of use to us in analysing the digital realm, itself constructed out of an infinite repetition of ones and zeroes:

The death instinct is discovered, not in connection with the destructive tendencies...Strangely, the death instinct serves as a positive, originary principle for repetition; this is its domain and its meaning. It plays the role of a transcendental, whereas the pleasure principle is only psychological. (Deleuze 2004, 19)

What is described here in Freudian terms as the pleasure principle can be understood as the Lacanian desire, what in the functions of consciousness is the Virtual. This Virtual functioning of consciousness is a purely psychological construction, in the self-positing process itself, whereas the death drive of the Real in the underlying presupposed void of subjectivity is where the traversal of fantasy and the transcendence of the constructs of subjectivity can occur. Subjectivity can thus be seen as a mask of itself, bound up in the Virtual functioning of consciousness that perpetually conceals its true nature – the abyssal void – beneath the surface assemblages of the human subject. In the Virtual, masks hide only other masks, and repetition therefore takes on a purely symbolic role. It is through the 'symbolic death' upon entering the digital realm that we might acknowledge the role of difference, not only in the simulation-of-simulation we experience but also in understanding the parallax modes of subjectivity. It is in this way that we can hold to Deleuze's assertion that "death has nothing to do with a material model. On the contrary, the death instinct may be understood in relation to masks and costumes" (*Ibid.*, 20) and, furthermore, that "death...is present in the living in the form of a subjective and differentiated experience" (*Ibid.*, 112). The death drive remains always a 'becoming' in the symbolic structures of consciousness, the always unattainable drive beneath the masks of humanity. Within the parallax manifestations of subjectivity – across physical and digital worlds – this relation of difference to the symbolic self can be overcome by the subjective attitude of death. This is explored in Tale of Tales' art game *The Path* (2009), which reveals through the Deleuzian 'becoming-animal' a conceptual and visual route towards becoming-death.

The Path brings the tale of *Little Red Riding Hood* into a horrific new interpretation as a third-person survival horror, set in the open-world of a forest filled with interactive objects, described as "a game in which the only way to win is to break the rules and die" (Newheiser 2009). With six sisters each set to 'follow the path' through the forest to their grandmother's house, the masks of repetition reveal the underlying desires of the characters. If the player follows the path, the destination is reached without incident and the game is lost, yet indefinitely repeatable. Should the player stray from the path, however, then each girl encounters their individual wolf – from the traditional beast of the youngest to a violent friend, middle-aged lumberjack or sinister old piano teacher of her sisters – waking outside

the grandmother's house, ostensibly having survived. The wandering of each girl thus reveals their own desires, be it friendship, musical talent or the sexual attention of others, within their process of becoming-animal. Each wolf appears to fulfil the specific desire, a Virtual projection creating a mask of fulfilment that upon reaching the status of 'become' is left inevitably empty when the girl wakes alone back on the path. It is not in the individual monsters, however, that the relation to the Real function of the subject is most relevant here. Rather, it is the path itself that constitutes the Lacanian 'fundamental fantasy' that we are attempting to traverse. This fantasy of the path is constructed both figuratively, in the mythology of the world in which the sisters seek the becoming of their own specific animal, and medially, in the game format that frames an objective to be achieved and the disruption of this in the necessary death for completion of the fantasy. The path of each character is thus twofold: the direct path towards the grandmother's house that follows gaming conventions in a goal-orientated world; and the indirect path of becoming-animal, towards the beast and the 'completion' of the game outside of expected parameters. At the conclusion of either path the girl arrives at the grandmother's house and the fantasy of the path appears maintained. It is only when the end is reached and the path 'becomes', as the girl achieves the formerly unattainable object of her desire, that the fantasy can be traversed and the underlying horror revealed.

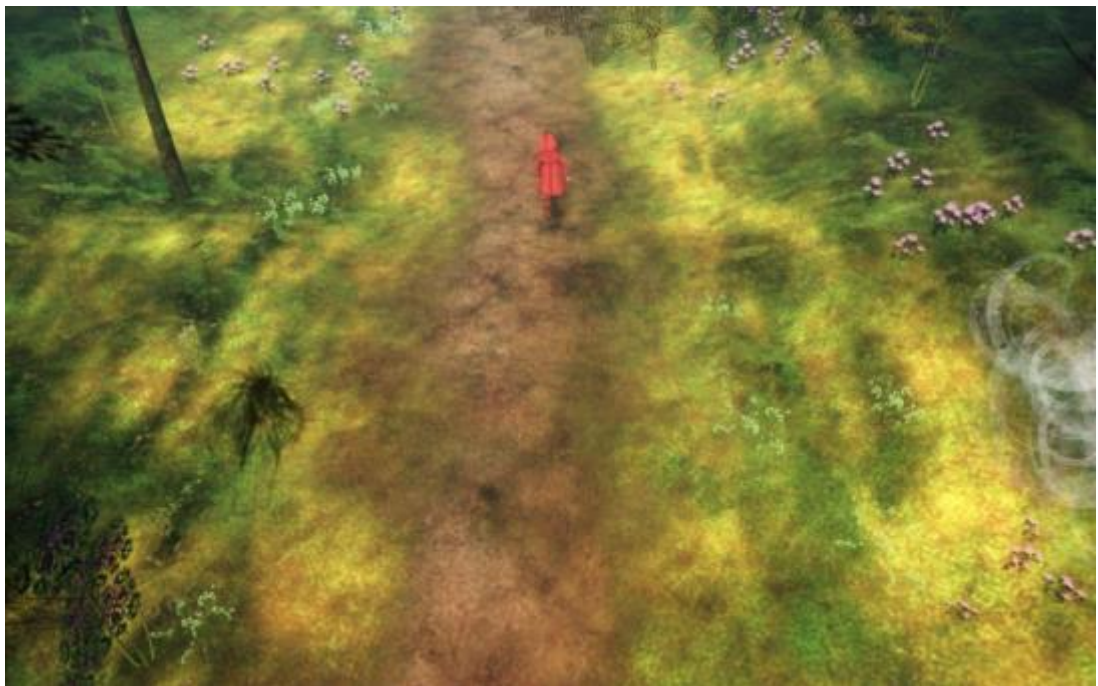


Fig.23 The Path (2009) © Tale of Tales
Little Red Riding Hood on 'the path' through the forest to her grandmother's house.

On entering the grandmother's house after encountering, and apparently surviving, the wolf, the brutal death occurs as the monster of their own desire brings about their destruction. This draws the player into the monstrosity, for we are complicit in the girls' deaths. Our exploration of the forest and control of the characters has led them directly to their grisly demise, and the shocking images are our brutal reward for our horrific actions. These expressionistic scenes of murder are prefigured in the painterly HUD (Heads-Up Display) that guides the player through the forest. Emerging as the player explores, the organic gestural shapes that surround the screen, and the quasi-abstract signifiers that lead towards fragments of narrative, serve as a creative accompaniment to the assemblage of desires around the player's perception of the path. Only by deviating from the conventional perception of the world, leaving the path of simple repetition and confronting the individual desire, do we reveal the defining fantasy of the grandmother's house and the innocence of childhood and thus achieve the pure repetition of death drive that underpins all our monstrous desires and paves the way for a new experience. The ending without the wolf encounter, without becoming-animal, is the same for each sister, exactly repeatable. The repetition of death, however, creates an artistic expression derived horrifically from what Stephen Zepke identifies in the Deleuzian conception of the creative process as "the sublime as the condition to any production of the new" (2011, 74). In embracing the disturbing consequences of the game, the player is given the opportunity to repeat the enacting of the



Fig.24 The Path (2009) © Tale of Tales
Off the path, a morbid encounter reveals aspects of the girls' fears and desires.

death drive on a different sister, thereby opening up a space for becoming-death within the entangled lived experience of the characters and the player.

As the characters of *The Path* wander further away from civilisation, ever becoming-animal to merge with their monstrous demon, they reveal the twisted goal of the game: the drawing of the player into the complicity of six young girls' deaths through the terrifying drive beyond the fundamental fantasy. The makers of the game have said that, "The Path is the exact opposite of a survival horror game in the sense that the goal of the game is the opposite of survival" (Harvey and Samyn in Newheiser 2009), and it is this aspect of repeatedly approaching death in the form of becoming our monstrous desires while chasing our fundamental fantasy that makes the game so interesting and so terrifying. Deleuze and Guattari describe 'becoming' as producing nothing but itself, and point to the gap in the relation between Virtual and Real in a "reality specific to becoming" (2004b 262). Here, that reality, that hard truth, is the differentiating principle of death in all its transcendental affirmation.

4.2.2 SORCERER, OUTSIDER, UNDEAD

Another art game by Tale of Tales exposes the antagonistic and suspended relation between the player and death in starker contrast. *The Graveyard* (2008), a small third-person game in which the player controls an old woman as she walks through a graveyard to sit on a bench, confronts the frail character's physical controller quite clearly with issues of death and persistence. The free download of the game is infinitely repeatable, described by the developers as having "no clear storyline because we want people to fantasize" (Samyn 2008). The fundamental fantasy here is the death drive itself as the lonely old woman simply sits and observes the graves of people she has known, while a song plays about various people's causes of death and the desire to join them. This is not so much a game but an affective experience "about being rather than seeing" (*Ibid.*), attempting to reveal some important insight into life and death as existence in different (yet overlapping in the graveyard itself) places, or merely as alternative modes of 'being'. The highlighting of Existence as a state independent of the life-death dualism emphasises this separation of Existence from the Virtual and the Real. The displacement of the fundamental fantasy from a construct of specific desires according to an individual subject's psychological assemblage toward the fantasy of monstrous death itself draws the subject inevitably into a state of undeath. If desire is always unattainable, residing in the Virtual functioning of consciousness, then the placement of death as the object of desire renders it always-already lost, and aligns death with the drive of

the Real. This fixing of the interplay between desire and drive, as life and death respectively, constructs the assemblage of the functions of consciousness as undead, always aiming towards death but unable to achieve it. In this sense all human subjects are always-already undead, it is simply made clear in the overt suspension of death in the digital realm and the gaming medium in particular. The digital inversion of Existence and Meaning places the essence of the subject in connection to the Real of computer code. To the digital subject Existence is secondary, insofar as the Real-Meaning connection is presupposed in the self-positing of Virtual Existence. That is, the communicable essence of the subject in the digital realm is defined by unseen binary code and the rigidity of the specific digital construct, with the appearance on the screen casting a perpetually becoming-immaterial subject that must continue in undeath until the code is ended (the program quitted or the computer turned off). Even then the 'saved game' can once again call up the undead subject, raised from the abyss into the realm of light and (un)life on the computer screen. *The Graveyard* makes clear this necromantic relation of user to undead manifestation, a dark 'magic' of subjectivity that persists even in the face of the desire for death.



Fig.25 *The Graveyard* (2008) © Tale of Tales
The old woman offers minimal interaction; her slow and laboured walk is our only access to the graveyard.

In the context of the Deleuzian becoming-animal, or here becoming-death, the player takes on this necromantic role as the sorcerer (Deleuze and Guattari 2004b, 264f), the human with arcane and mystical knowledge that grants access to and control over the bestial becoming, while the old woman takes the place of the demon (*Ibid.*, 268), the 'exceptional individual' surviving beyond the people she knows and loves that allows the interaction between the living sorcerer and the dead that the player 'becomes'. The 'anomalous choice' of

this character on the verge of death is reminiscent of the eponymous character from H.P. Lovecraft's 1921 short story *The Outsider* (2011, loc 2721-2829). Throughout Lovecraft's work, the terrifying monstrosities such as Cthulhu are portrayed as lost objects manifesting from the darkest corners of the Real, and the demands for the sacrificial deaths of humans to bring about their return displays the links between an immortal monstrous being and the death drive as the key to crossing from the bordering realm of abyssal horror into our own world.²¹ Indeed, as Deleuze and Guattari have written, "Lovecraft applies the term "Outsider" to this thing or entity, the Thing, which arrives and passes at the edge, which is linear yet multiple" (2004b, 270). This monstrous image of the self in the gilded mirror of the screen is neither subjective nor objective, it rests on the phenomena of bordering, and the graveyard portrays such a place of contact between the worlds of the dead and the living. In this way the player as sorcerer occupies for Deleuze and Guattari an "anomalous position" in which they "haunt the fringes...between villages" in "a relation of alliance with the demon as the power of the anomalous" (*Ibid.*, 271). These spaces between bordering realms – physical-digital and living-dead – are where the subject is 'becoming-death', a parallax collision. This is the violent construction of a new assemblage, across desire and drive, along both sides of fantasy, in which the Virtual of consciousness is brought into contact with the Real of the void. The subject creates this becoming-death between the (symbolically) dead self on the screen and the two forms of continued life: digital 'reloaded' life-as-currency and physical 'controller' life outside the game.

The Graveyard's shortcoming lies in its submission to both market economics and the admission of death. The developers made great efforts to escape the traditional paradigms of the gaming world, indeed their creation was often dismissed as 'not a game' even by other art game designers, and claimed that "of course there is the expected response of the typical gamers whose desire for zombies whenever they see a cemetery is apparently insatiable" (Samyn 2008). Yet the old woman, representative of our own undead selves on the cusp of death but not quite able to grasp the release from such drive, receives her empty fulfilment in the 'full' version of the game. In this version, available for a small fee, there is a chance that the old woman dies while sat on the bench, thus undermining her status as the anomalous choice of the Deleuzian demon and submitting to the fulfilment of death-drive. This is an empty fulfilment, for it is the undead state 'between two deaths' of the player-sorcerer in relation to the anomalous character-demon that makes the experience truly unnerving.

²¹ Lovecraft writes of the monstrous Cthulhu, "that is not dead which can eternal lie, and with strange aeons even death may die" (Lovecraft 2011, loc 2275).

A similar example can be seen in Playdead's *Limbo* (2010). With only the tagline "unsure of his sister's fate, a boy enters limbo", the player is thrust into a dark and horrifying world of survival puzzles in what its designers label a "learning by dying game" (Carlsen in Sheffield 2010). Throughout the game, the dark character exists in a state 'between two deaths', and the ending remains inconclusive as to whether the boy, his sister, or both are dead. Much debate has raged on the meaning of this ending, with its deathly imagery open to wild interpretation. With the developers providing no explanation, the title of the work alone would suggest what can be described as a state of superposition of life and death. The game maintains a space between two deaths, here between the death of the boy and his sister, with neither being able to escape into a definitive state but rather remaining in the abyssal realm of the undead or becoming-death. Despite this apparent suspension of death amidst a visually morbid world created from layered shades of black, however, the openness of this 'becoming' is once again rendered moot by the gaming medium itself: the game ends. The return, upon reaching the sister, to the start menu, albeit with a more decayed background, forces a closure, an acceptance of some form of death even if it is unclear whose. The player persists but the demon is dead and with it the player-sorcerer's access to becoming-death.



Fig.26 *Limbo* (2010) © Playdead
The dark world of limbo holds many images of death and decay.

4.2.3 UNDEATH IN NON-GAMES

If the gaming medium is inherently limited as to its effectiveness of becoming-death, perhaps we can look to non-game virtual worlds for a relation to our state between two deaths.

Second Life demonstrates, in its advertisements to 'be a vampire' (Linden Labs 2014) and its

vampire, lycan and neko avatars, a freer mode of expression in the subject's link to becoming-animal, becoming-monster and becoming-death. More than simply an outlet for our deepest monstrous desires, the SL avatar exists perpetually, immortally, and our relation to it exists for as long as we are logged on. The proliferation of undead characters, and areas designed to accommodate them, within SL demonstrates an attempt to reach Deleuze and Guattari's "contagion of the pack" (2004b, 268), such as the vampire's 'bite' in the 'Bloodlines' game, in which the user-sorcerer relates not only to their undead self but also to other undead subjects through the avatar-demon. Within the Bloodlines HUD system, a third-party roleplaying add-on played out in but not part of SL, there exists a mode of interaction with those who have not chosen to join the game, placing the souls of such avatars in a state of limbo. While this is only of relevance within the game mechanic, the imposition of the 'curse' of undeath on others reveals an instructive extension of the pack by contagion, whereby the modes of perception available to an avatar create an additional element of parallax within SL. The assemblage of a non-Bloodlines avatar thus takes on the curse or contagion as a parallax stain, a black spot only seen to those with the HUD and inaccessible to the 'victim'.

The creation of game elements within open digital worlds such as SL, enforces only the narrowest view of what Žižek sees as the digital manifestation of the 'between two deaths', the split between loss of a single life and loss of the game (Žižek, 2008b, 150). However, there are many other expressions of 'between two deaths' without sustaining the fantasy of the winning-losing dualism, allowing us to examine the broader split between digital and physical self as the experience of symbolic deaths apart from our eventual physical demise. Such a view can highlight the underlying tensions in the visual construction of an avatar which is expanded and inverted by the use of game elements such as Bloodlines within SL, where the use of the added interface creates further perceptual worlds in which to engage. The becoming-death of the Bloodlines game is symbolically separated from the immortal avatar of SL, which is in turn separated from the mortal human user on the other side of the screen. The visual cues of appearance can therefore take on a duplicitous signification as a key to unravelling the perceptual abilities of another user, for example the iconic vampire clothing that can state a fashion preference, social group or expanded interface and entry into an alternate view and internal parallax of the SL world. Between the multiplicitous options available in the construction of an avatar, through the assemblage of HUDs, bodily appearance and clothing, the chosen image becomes the 'anomalous choice', the one that persists, acting both as a mask on our behalf and as our link through the masks to the digital realm of undeath itself. In this way, the becoming-death can be maintained, allowing the subject to exist between its physical 'controller' body and its digital 'avatar' image in the gap

between worlds and between deaths, perhaps reaching beyond our psychological pleasures of desire, traversing the fantasy to our transcendental state of drive.

4.3 QUANTUM IMMORTAL

4.3.1 QUANTUM SUICIDE

Thought experiments on quantum suicide, based on Everett's 'many worlds' interpretation of quantum physics, reveal an instructive relation of the subject as an engaged spectator between actor and observer when applied to the digital realm. Quantum immortality, first posited as the problem of quantum suicide by Hans Moravec (1988, 188), is an inverted formulation of the Schrödinger's Cat thought experiment, from the cat's perspective, whereby a quantum measuring device determines the trigger of a lethal apparatus. Within the Many Worlds theory, at each measure the superposition of both possible outcomes is sustained – manifesting as parallel universes in which one version lives and the other dies – but only one outcome will be observable to the engaged subject (namely life, given the impossibility of experiencing being dead). Expanded to any such lethal incident, there is thus necessarily one version of the subject that will remain living no matter how improbable their survival (from, for example, sitting in the middle of a nuclear explosion). Tegmark (1998) expanded this notion by insisting on the non-binary nature of such events outside the experiment, suggesting that for every dead-or-alive version of the subject there will inevitably be many different injured and maimed versions. Thus in our everyday lives we might consider the notion that at every moment, alongside our perceived slow march of mortality, versions of us are improbably killed and improbably survive a catastrophe. Tegmark highlights the impossibility of experiencing this state of superposition, or even being aware that its possibility exists, outside of the isolation of the thought experiment, particularly to another observer. Within the digital realm of symbolic death, however, we can stage this event and observe our own death and survival. In the short subversive art game *Every Day the Same Dream* (Molleindustria 2009), this is staged for an office worker who is given the opportunity to leap to his death only to reawaken as if nothing happened, with only the player aware that any fatality has occurred. The subject is here confronted with an inescapable immortality

within the tortuous drudgery of contemporary labour, held in a paradoxical state between life and death.²²

In developing our understanding of the quantum realm, Bohm has outlined the importance of Existence as a process, what this thesis labels the functions of consciousness as a Virtual abstraction from the pure flux of the void of subjectivity; a common structure of knowledge that forms a given world of both material and mental processes. Bohm writes, of both reality and our knowledge of it, that “all *is* flux. That is to say, *what is* is the process of becoming itself” (2002, 61). It is this perpetual ‘becoming’ of the wave function, upon which the structures of quantum physics are built, that leads us to the underpinning reality of the quantum immortal. Against the Copenhagen Interpretation that has dominated the debates in quantum mechanics, the key factor for the ‘Many Worlds’ interpretation, which seeks a purer form of mathematics in a more abstract conception of reality, is that the wave function does not collapse. Rather our observations actualise individual possibilities as different realities viewed from our own subjective position. In response to criticisms of the ‘Many Worlds’ interpretation, by those who would prefer the finality of the collapsed wave function and the state of ‘become’, Tegmark points out that “Everett does NOT postulate: At certain magic instances, the world undergoes some sort of metaphysical “split” into two branches that subsequently never interact” (Tegmark 1998, 856). Implicit in Everett’s thesis is the notion that the many worlds, many iterations of the subject and many deaths, are intrinsically linked and continue to interact beyond the moment of observation/decision where an apparent probabilistic split occurs. In our relation to digital technology this is evident through the potential for multiple selves, all living and dying, tied to our physical self across the ‘gap’ of causality that is formed by subjectivity itself.

The parallax of the undead digital subject obscures our viewpoint from the void of subjectivity, but the assemblage of worlds connects all fragments of the subject across time. While the extrapolation of the Many Worlds Theory over time appears as a tree of probability, the viewing of simultaneous paths staged in the digital universe appears more like Deleuze and Guattari’s rhizome; a map of potentiality rather than a tracing of actualisation (2004b, 13). This intervention of the subjective view point draws the thought experiments of the quantum immortal into the conceptions of becoming-death. It is the role of the engaged spectator that defines such a system and such a subject. Viewing the digital monstrous self between two deaths is a radicalisation of what Bohm defines as “*proprioception*, which means ‘self-

²² The torment of reliving and manipulating the moment of death is a common trope in films such as *Source Code* (2011) or *Edge of Tomorrow* (2014), or the repeated deaths of Kenny in the animation *South Park* (1997-2013).

perception” (1994, 121). This is a disruption of the subject-object relation that we have seen expressed in avatar-mediation, through what Bohm describes as the state in which “the observer *is* the observed” (*Ibid.*, 213) inherent to the construction of all observed realities, exemplified in the continued existence of the subject through the staging of life and death on screen detached from physical mortality. This act of digitally observing one’s own death is therefore an engaged position, essential for traversing the fantasy and occupying the space ‘between two deaths’.

As Bohm suggests, “the question of death is very long and subtle” (1994, 59) and, in the context of a Deleuzian becoming-death, we might add that it is very repetitive. In *Every Day the Same Dream* we are forced to experience the repetition of daily life and death. Controlling the simple and monotonous movements of a worker as he gets up, drives to work and sits in a cubicle among other identical workers, we see the futility of perpetual existence. We can even walk past the cubicle, find the roof of the office building and jump off, only to wake up for work again the next morning. It is as though we are the quantum immortal, our death perceived by others in their stream of reality but ourselves perpetually shifting into the world of undeath. However, as with quantum observation, in which, “in order to say that an observer O has observed the event *a*, it is necessary that the state of O has become changed from its former state to a new state which is dependent upon *a*” (Everett in DeWitt and Graham 1973, 64), the physical player-observer is simultaneously outside of and engaged with the deaths on the screen. Indeed, if we explore the possibilities of our interaction with the world of *Every Day the Same Dream*, then we can gradually alter our monotonous existence. Just as in *Limbo*, we are learning through the observation of our own self-destruction. Being taken by a homeless person to a graveyard, visiting a cow, catching a falling leaf, arriving at the office without clothes; each small rebellion alters our perception of the daily routine until, as the lady in the elevator claims, “you will become a new person” (Molleindustria 2009). Each possible variation or death here becomes a new world, a new potential perception, creating a different reality in the parallax of the subject, a principal expressed as “choose your reality” in *Perfect Dark* (2000) when selecting a saved game profile. Every potential played out in the digital realm attaches itself to the assemblage of the subject, viewed as a perpetual becoming-new in the suspension of death on the screen.

After finding all the alternative interactions and perceiving all possible iterations of the quantum immortal within the game, jumping from the roof leads to a final awakening, seemingly identical with every other day but with a new and final observation. In this new world, perceived by the ‘new person’ the subject has become, the office is now empty and on the roof we see the last worker jump before the game ends. Here the character joins with the

player in observing the death of an identical image of the worker, escaping their existence through the finality of the death drive. The game-ending paradigm has shifted by transferring the final death onto another, thus denying our own release. As with previous examples, however, the ending of the game and the fulfilment of the death drive limit the experience of quantum immortality by the complete removal of all other potential observers. The last observation does leave open a small space for the potentiality of 'becoming-death' in response to the quantum immortal state. The character-demon takes the place of the 'anomalous choice', having reached the new state of observational awareness and 'become a new person', albeit one condemned to immortality while all others achieve the final release of death. For a brief moment, however, before the structure of the game medium asserts its insistent and inescapable finality, we approach the engaged external observation necessary to reveal our fundamental fantasy of the death drive. Even after the game has ended, we as physical player have observed our own and others' deaths, only to return to our familiar mortal perceptions.

4.3.2 THE SPECTATOR IN CYBERSPACE

The enlightening resolution to the dilemma of quantum immortality with cyborg subjects, and the key to traversing the fantasy without attempting to fulfil the death drive, is thus the overcoming of observational limitations on the superposition of living and dead states. Tegmark explains that "quantum superpositions were found to remain observable only so long as they were kept secret from the rest of the world", where even colliding with an air particle acts as an observation "destroying the coherence of the superposition and making it unobservable" (2007a, 24). In cyberspace there are no air particles, creating Tegmark's purely mathematical 'bird' view: "the *outside view* of the world (the way a mathematical thinks of it)" (1998, 857). That is, the digital realm of computational process perpetuates our Existence outside of our subjectively engaged, or 'frog', view, in a frictionless space of reversible observation.²³ We can experience such a 'bird' view of our actions in the art game *Braid* (2008) by Jonathan Blow, in which the player can control time, reversing mistakes and even death. Freed from such trivial matters as 'losing', we can thus explore the potential for interaction more fully, with time flowing differently for different objects at different points in space and the character's flexible engagement with the environment. The rewind function even allows, in one level, alternate versions of events to be played out simultaneously, observing dual sets of actions to solve puzzles that would not be possible in the normal time-stream of classical

²³ These two views could also be positioned in relation to a parallax between the embedded first person (frog) and godlike third person (bird) views that frame our relation to the narrative world of a game.

physics. Tim, the protagonist, appears also to be acting in multiple metaphorical worlds. The presented quest for a princess and desire to undo past mistakes is full of references to the aftermath of an atomic bomb and the perilous quest for unattainable godlike knowledge. The player is given an unprecedented control over their own actions in time, much like the quantum immortal that persists regardless of the mistakes they make (the quantum immortal would even, in at least one parallel world, survive the most apocalyptic nuclear blast), yet is confronted with the unresolvable trauma of the character when such control leads only to unhappiness. The digital realm provides the tools to view many actualised possibilities. However, does it equip the subject with the psychological resolve to truly traverse the fantasy and engage with the death drive that such undead possibilities can unleash? The staging of a frictionless environment creates a new space of becoming in which to approach such issues that lie at the abyssal core of human consciousness, allowing the focus to turn to the parallax of this space as it occurs within the subject itself.



Fig.27 Braid (2008) © Jonathan Blow/Number None Inc.
Two timelines can be played out simultaneously in a self-co-operative mode.

The environment, the system of rules governing a given world (whether this be the behaviour of particles or the code written in bits), is not the only source of interference in staging impossible observations. The observer itself plays a significant role in determining the nature and outcome of their perception. This is more than simply a socio-cultural bias or physiological variation that tailors the interpretation of perception and the development of 'taste'. Rather, there is a fundamental interference built into the nature of observation, described by Tegmark and Wheeler as the conditions by which "decoherence of our neurons ensures that we never perceive quantum superpositions of mental states...our brains

inextricably interweave the subject and the environment, forcing decoherence on us" (2001, 78). Within any model of consciousness outside of material determinism, the conditions of possibility for observation create an obstacle in staging the type of 'pure' mathematical observations available in thought experiments (Schrödinger's cat, quantum suicide). Just as the environment acts as an engaged participant, brought into a new world with the probabilistic split of each measurement, the observer itself functions as an environment with its own conceptual framework of interference as the perspectival parallax of an engaged spectator, an assemblage (re)created with each new world. In confronting the role of the observer in creating the specific world, the actualised branch of probability, Mark Rubin takes the creation of copies of the observer, what has been called the 'many-minds' interpretation (Lockwood 1996), even further by suggesting a 'labeled copies interpretation'. In this formulation "interactions between entities label those entities" and "it is the attached labels which ensure that the "correct" copies of each of the observers interact" (Rubin 2001, 314), which suggests a linking of the signifying processes within consciousness with the formation of not only a specific world but a specific subject. This process displays the dominance of the Virtual – the big Other supporting symbolic structures – in binding the other functions of consciousness together, and in doing so concealing the other potentialities that might have been available were the subject to escape the illusion of linear history the Virtual creates. This emphasis on the label within the human mind functioning as the actualising force behind the structures of reality, and the negotiation of such labels between subjects as a the construction of an agreed social reality through the process of communication, suggests an inherent nominalism that, just as in Deleuze's philosophy, is attached to the processes of actualisation and life (O'Sullivan 2009, 167). Within quantum physics there is the tension between the material and the ideal that has plagued philosophy for millennia, and it is our relation to the role of engaged spectator that defines both the subject and the universe in which it exists.

To apply such a dilemma to the staging of a detached space-time in *Braid*, we might also consider the notion of observation and time in Einstein's Relativity. Fritjof Capra summarises this notion: "different observers will order events differently in time if they move with different velocities relative to the observed events" (1992, 71). This can be compared back to Everett's notion that "measuring processes [i.e. observation] will appear to be irreversible to any observers (even though the composite system including the observer changes its state reversibly)" (in DeWitt and Graham 1973, 97). This is the true power of *Braid*, that we, as physical, enduring player, *can* observe our own death and its reversal, as well as the effects and interactions of multiple timelines. It is in this way that the puzzles of *Braid* achieve such satisfaction in being solved. With 'death' no longer a concern, as one reviewer

described it: “you can’t help but smile to yourself at how elegantly simple the whole thing is. It was never difficult at all – you just weren’t thinking in the right way” (Bell 2008). In the context of the quantum immortal, we might add ‘you just weren’t living (or dying) in the right way’. It is not our natural mode of observation to experience multiple timelines, multiple outcomes and multiple deaths simultaneously, let alone manipulate and control such manifold potentialities to our own ends, yet in the digital medium we *can*. We perceive the bird and frog views simultaneously, although what hybrid monstrosity we become in the process is not clear. To enter such a space, it is necessary to think probabilistically, in relation to the outcomes of the game and in relation to death itself. If a digitally mediated symbolic death holds no fear over the player as a quantum immortal, and if outcomes can be tested, reversed and ‘re-measured’, then probability itself becomes a mode of experiencing and navigating worlds. Mark Buchanan (2007, 17) highlights the recent progress in the Many Worlds interpretation by physicists such as David Deutsch and David Wallace in exposing the necessity of a perceptual adaptation of many-worlds subjects, reinserting a subjective role for probability to an engaged observer even within the notion that all possibilities actually are occurring simultaneously. To consciousness, probability becomes the guiding factor in navigating the impossible and unknown ‘between’ spaces of both quantum and digital immortality. As David Albert expresses in his discussion of the effects of the suspension of wave function collapse on the human mind, and the possible perceptions that step outside of the limited engaged view to perceive the position of the observer itself, “the mental lives of quantum-mechanical observers who could arrange to carry out these sorts of measurements on their own brains would perhaps be unimaginably (for us) rich” (Albert 1992, 189). Were we to permanently achieve such a level of engaged observation without causality, we would be in the realm of the posthuman: a virtual monster indeed.

4.3.3 THE SUBJECT BEYOND THE GAME

Quantum physics, as with humanity’s long history of spiritual and philosophical pursuits, displays a search for “a reality which lies beyond existence and non-existence” (Capra 1992, 167). Here that search is for a reality of the subject as the gap between two deaths. The transcendental, posthuman possibilities of the technological enhancement of our observation regarding the self reveals Žižek’s “abyss of pure subjectivity”, the fact that “the ultimate traumatic Thing the Self encounters is the Self itself” (2009b, 210). In the face of immortality, reversibility and *disengaged* spectatorship, the source of horror is the subject itself. The paradox of becoming-death thus persists in the quantum immortal within its own consciousness and the troubling relation to the digital immortal self shows our inability to

cope with the internal void of subjectivity. In the space of becoming within the subject, we can reassert Žižek's claim that immortality is more traumatic than death. If this gap between two deaths, between physical and digital worlds, is precisely the subject, how can it be confronted without resorting to the finalising 'end' of the game medium? How can the staging of a state between two deaths be sustained to open a critical space within the structures of fantasy?

We can look again to non-game virtual worlds, such as SL, for examples of this infinite expression of the undead self and its use in confronting the gap within and of our own subjectivity. By deconstructing the self through the 'monstrous' observational processes discussed, we can move past the seemingly nihilistic teleology of our response to death drive, towards an engaged spectatorship of our own life (or lives) and death(s). As Bohm suggests, "the point is to have the notion of a *creative* being, rather than of an *identified* being" (1994, 169), a shift of function from embodying the subject in a specific world under the regimes of the Virtual towards an expression of subjectivity in making contact with the Real. A great deal of effort is spent on attempts to solidify our digital presence, in the finitude of our playable characters or even the precise image of our avatars, and it is easily forgotten beneath the Virtual functioning of consciousness that the perpetuation of the subject lies not simply within the digital world, nor indeed in the physical world, but rather *between* the two worlds. It is this gap that the lack of finitude must help us confront, and the power of the art games that have been discussed is their ability to open up such a space in which we can interact with the internal void of our own (im)mortality. The digital exploration of the quantum immortal can expose the fundamental fantasy of ourselves *as subjects*, and reveal our death drive in both worlds. Perhaps, then, the reason so few examples of digital culture embrace the undeath of the Virtual monster is that we fear the very immortality it offers us. If we seem to live forever on the interface screen, how then can we return to our mortal lives as finite humans?

4.4 PORTAL: GLaDOS

4.4.1 COMPUTER AS MONSTER

There now follows an analysis of a cultural application of these principles in the narrative world of Valve's *Portal* series (2007; 2011). These games stage a state between two deaths for both the interaction of the player and the construction of a monstrous antagonist, negotiating the cyborg subject in relation to the Virtual monster as both becoming-death and quantum

immortal. The role of the subject-player within such a construct is thus an engaged spectator, both observing and suffering digital undeath. The main antagonist of the series, the “lethally inventive, power mad A.I. named GLaDOS” (Valve 2011), personifies the eternal desire of the Virtual monster in the form of the computer. For the cyborg subject, the digital medium itself forms the construct of the fundamental fantasy. The Real of code as the inaccessible machinic functioning of the imperative of Meaning forms the drive that is concealed by the Virtual-Existence appearing to us on the interface screen. Just as the workings of code that define the digital realm are hidden from the user, GLaDOS is never mentioned directly by name in the *Portal* series, referred to instead as ‘her’, as if a nameless and therefore unknowable big Other beyond control or comprehension. In this way the computer is able to embody not only our fundamental fantasy of the medium we are not yet able to fully enter, but also the expression of individual monstrous desires. Her drive towards ‘testing’, the eternal quest for more data in the name of science, fuses such desire with drive. The computer-based villain is thus also a consciousness situated mid-traversal of its own fantasy, already making contact with the state of perpetual drive in its coded, task-oriented, inflexible priorities that the more erratic and desperate human mind cannot achieve. Can GLaDOS therefore be seen, despite her apparent psychopathy, as a ‘cured’ subject? Certainly, many expressions of posthuman or transcendent consciousness display a freedom from such petty concerns as morality and causality.

It is in the co-operative mode of *Portal 2* (2011), with a pair of robotic test subjects, that we see the unsatisfactory conclusion of such transcendence. GLaDOS initially praises the robots for their lack of human failings, but quickly yearns for subjects who can experience the motivation of mortal fear. While the robotic characters Atlas and P-Body are inadequate subjects for both GLaDOS’s ‘tests’ and our analysis, her responses to them reveal a great deal about the problematic nature of the computer-as-subject. She reassures her subjugated minions with the consolation; “don’t worry, you can’t die, they will just reassemble you” (*Portal 2*, 2011). However, this supposed immortality is seen as both a benefit and a failing, with the computer’s synthetic, calmly demented voice lamenting: “electrocution, shot, drowned, crushed, burned in goo. Oh, sorry. I was just thinking of all the ways humans can die. You can’t die in any of those ways. You just keep testing and testing, with perfect results and no consequences” (*Ibid.*). The apparent machinic perfection clearly troubles GLaDOS, who gradually realises the need for the drives of human frailty in her subjects, even asking: “without the looming consequence of death, is this even science?” (*Ibid.*). The equation of science to death explicitly displays the underpinning Real of GLaDOS’s consciousness: humanity, as much as the experimental technology, must be tested. Despite her disregard for

an individual human, viewing the player simply as a research tool, it is humanity as a whole that forms the lost object cause of desire for this computerised machinic consciousness.

The threat of death is what maintains drive. As *Limbo* and *The Graveyard* have demonstrated, the fulfilment of death is an empty gesture that fails to awaken the subject to its fundamental fantasy. GLaDOS is unable to traverse her fantasy of scientific knowledge without the fragile, unstable and irrational nature of human consciousness, despite the fact that she perceives humanity as the underlying cause of her dilemma. It is this emergent unpredictability of human subjects that has drawn humanity into the role of lost object to the computer. As the digital realm constructs the space of fantasy for humanity, so does the human play a role in the construction of a computer's desire (having programmed the machine), fantasy (as the problematic construct of ideal in the species as a whole) and drive (as 'lost' mortality to the immortal machine). The monstrous otherness in the relation of human to computer makes apparent the presupposed gap between physical and digital worlds and the over-identification of contemporary humans with a nostalgic purely physical view of themselves.

The end credits of the two single-player games, styled as personnel files for the assessment and dismissal of test subjects (Coulton 2007; 2011), display this confused relation to humans: a programmed desire to help humanity as a whole against a derisive indifference for individual human suffering and personal hatred of the specific human protagonist. The first game concludes with GLaDOS insisting that she has survived her apparent destruction, and will continue functioning with the imperative to test long after the player has died a natural death, while the second game focuses more on her direct relation to the player, allowing the character to leave but taking the abandonment as a personal slight. In freeing, rather than killing, the test subject, GLaDOS further emphasises the inevitability of human mortality, coupled with an assertion that humans have been replaced by the self-fulfilling testing of purely computerised systems. However, this suggests that the 'deletion' of the player character from the facility – and also from the medium at the game's 'end' – will instigate a shift in GLaDOS's assemblage of consciousness, concealing the traumatic events of the games with the construction of a new fantasy free from any relation to humans. The human subject is again a lost object to the monstrous immortal computer and, as seemingly the last such subject available for testing, represents a signifier for GLaDOS's abandonment by the entirety of humanity (even though the narrative reveals that she herself killed the facility's staff with neurotoxin within moments of being activated). This allegorically demonstrates the need of any computer for a human user, both in terms of coding to create its Real-Meaning and also 'turning on' to initiate its Virtual-Existence, just as physical human

subjects require biological parents (Real-Existence) and a socio-linguistic upbringing (Virtual-Meaning). The computer's immortality is vaunted as the status of a higher being, yet shows a vulnerability when the perpetual structures of desire and fantasy are challenged. Thus, at the end of the co-operative game, the robotic test subjects Atlas and P-Body are destroyed after finding thousands of humans in storage. The virtual monster can return to its perpetual cycle of enforced drive, within its own fundamental fantasy of hated humanity.

4.4.2 BEYOND PHYSICS: IMMORTALITY AWAITS

The scientific advancements of the Aperture Science Enrichment Centre, the testing facility that GLaDOS controls, include the ability to "have your brain scanned and permanently backed up in case something terrible happens to you" (*Portal* 2007). The player-character Chell is forced to test eternally, backed up for future use at GLaDOS's whim. Yet the immortality of the player-character is not certain, and its fragile state as controlled information becomes a threat of the expulsion from becoming-infinite, a return to the brutal effects of causality. After Chell escapes the testing area and GLaDOS cannot take out her rage by killing the rogue subject, a greater threat is issued, a threat to Chell's 'immortal' being:

Stop squirming and die like an adult or I'm going to delete your backup. STOP! Okay, enough. I deleted it. No matter what happens now, you're dead. You're still shuffling around a little, but believe me you're dead. The part of you that could have survived indefinitely is gone. (*Portal* 2007)

Immortality is still portrayed as a gift, and its removal or 'deletion' the ultimate threat. The need within the game-based environment for the threat of death as failure is evident in the construction of GLaDOS's control over Chell, yet the lack of a game-losing 'final' death is replaced with infinite 'lives' in the enforced perpetual testing. This is a traumatic state between two deaths, evidenced by the instant regeneration in order for testing to continue. There is no currency of lives to win or lose here, only the machinic desire of the game.

Immortality thus becomes a curse, illustrated by Žižek in his analogy of zombies as the oppressed class locked in an undead state of eternal mindless servitude (2014). However, the relation between single life, absolute death, infinite life and temporary death is complex. At various points through *Portal 2* it is clear that Chell has been kept alive for testing well in excess of her natural lifespan, past the degradation of the complex and potentially beyond the end of humanity itself. GLaDOS now uses permanent testing, an enforced and enslaved immortality similar to the curse of undeath, as a threat and the source of her power over her human subject. The immortal machine can comprehend no reason why the frailty of human flesh should give cause for respite from the ongoing function of the facility, using taunts about missing Chell's birthday, falsified daylight and human mortality to assert its role as an

immortal functional becoming of continual computer processes. The addition of a human factor to the assemblage of artificial consciousness forms a necessary but inconvenient blind spot in the infinity of immortal life. Urgency is created by mortality, underpinning the simultaneous loathing and reliance on humanity by the machine.

The human subject as 'test subject' is forced into a perpetual becoming-death, always on the brink of destruction as a Schrödinger's Cat, displacing its desire onto the external observer/tormentor. Lacan states that "man's desire is the desire of the Other" (Lacan 1977, 38) and the completion of the test is the only end to the trauma presented to the test subject. The all-powerful computer takes the role of big Other, quantum immortal and forceful demon, binding the sorcerer-subject to the state 'between' at the whim of its programmed desire. Even GLaDOS's empty promise of cake at the end of the testing provides a mocking comment on the frailty of humans when confronted by a digital adversary. The internal conflict of a human attempting to enter a purely digital realm is raised clearly in the need for food. As the RPG *Baldur's Gate II: Shadows of Amn* points out in its load screen: "While your character does not have to eat, remember that YOU do. We don't want to lose any dedicated players" (2000). The perpetual functioning of an immortal computerised consciousness occupies a space of purer Virtuality than the human mind, freed from even such basic distractions as the need for food or sleep, both of which GLaDOS uses to spite her captive. Yet the computer's insistence on immortality is not only a curse for the human test subject, but also for the machinic torturer:

I discovered I have a sort of black-box quick-save feature. In the event of a catastrophic failure, the last two minutes of my life are preserved for analysis. I was able – well, forced really – to relive you killing me. Again and again. Forever. (Portal 2, 2011)

This is the true fate of the self-observing quantum immortal, not viewing all strands of possibility in a charmed life free of consequences but living constantly *in* the moment of death, experiencing the agonising pain of perpetual death throes in superposition with everyday life. Here we uncover the self-destructive tendency within the search for immortality, revealing what Lacan identifies as the "essential affinity of every drive with the zone of death" (1977, 199). Not only is death an *objet a* amidst eternal suffering in repeated lives of 'testing', but the Real of all consciousness appears as death against the Virtuality of life. The fundamentally presupposed condition of humanity, its only truth, is the certainty of death and our relation to the void. This is the existential crisis and monstrous core that drives humans, for good or ill, and creates the eternal fantasy for posthuman immortality. Indeed it is this relation to death that creates the mutual reversal of the role of big Other between human and computer: the mortal and immortal require each other to define their mode of

desire between eternal life or final death. Emptiness, fragility and nothingness is the ultimate fate of the human subject, and it is through the staging of symbolic death and immortality in our interaction with the digital realm we construct the becoming-(un)death that allows us to critically approach the impenetrable monstrous kernel of reality. By culturally representing these tensions between the Virtual and the Real in cybernetic immortality, games such as *Portal* stage the fantasy of the digital itself: the barrier of a nostalgic humanity that must be traversed if consciousness is to be re-thought as a cyborg subject.

4.4.3 (IN)HUMAN MONSTERS?

The essential nature of the death drive is rooted in humanity itself. Humans are inherently flawed, in that their fundamental fantasy creates monstrous desires that can unleash both an unyielding need to survive and a cyclical drive towards death. This can at any moment turn inwards, or be transferred onto others, as evidenced by the Chell's first meeting with GLaDOS after she destroyed the computer in the events of the first *Portal* game:

Oh... It's you. It's been a long time. How have you been? I've been really busy being dead. You know, after you MURDERED ME. Okay, look: We both said a lot of things that you're going to regret, but I think we can put our differences behind us; for science... you monster. (*Portal 2*, 2011)

The death drive seated beneath all human desires is thus an inescapable quality of the monstrous core of subjectivity. As Žižek describes, "the subject *as such* is toxic in its very form, in its abyss of Otherness" (2009b, 46), and it is this inherent lethality that we see not merely in the protagonist but also in the player. Each time the user turns on the computer and enters the game, they are instigating the perpetual torment of their character embodiment. This complicity is made apparent in the *Portal* games by the unceasing testing that occurs until we complete the game or turn off the computer. This is the same causality seen quite brutally in *The Path*, in which players themselves are drawn into the world as the very source of the girls' violent demise. However, while *The Path* is an overtly morbid game confrontation the subject with a clear staging of death, the *Portal* series is not explicitly concerned with mortality. Instead the series appears as puzzle-platform games with a game-play focused on the distortion of physical space, including the horrors of immortality as a critical undercurrent within the otherwise light and often humoristic cultural and fictional framing of the game environment and characters. It is when engaging with the tensions built into the character GLaDOS that the complicity is revealed and the human element outside of the computer is shown to be yet one more source of monstrosity within the digital realm.

GLaDOS herself has an element of human monstrosity in the form of Caroline, the Aperture Science employee unwillingly uploaded into the experimental Genetic Lifeform and

Disc Operating System. The relation between GLaDOS/Caroline and Chell provides a useful analysis of a bio-computer hybrid in assessing our own underlying monstrosity displayed before us on the computer screen. If, as Žižek states, “symbolic power is by definition virtual” (2008a, 194), then the altered functions of consciousness within the computer form the ideal battleground on which to confront our monstrous selves. Furthermore, if the hybrid monster of physical self and digital projection can allow the Žižek’s conception of the subject to “construct his Self as an aesthetic *oeuvre*” (in Wright and Wright 1999, 112), then we can look to this hybrid as a genuinely creative being. While this is reminiscent of the Boxmaker, the fragmented AI ‘artist’ in Gibson’s *Count Zero* (1995b, 296-302; 309-12), the bio-computer hybrid formed from a human subject becomes something altogether more monstrous. Yet this does create problems relating back to our human self and ‘pure’ conceptions of humanity in general, as further evidenced by GLaDOS’s problematic relation with both her own human element, Caroline, and her human test subject, Chell:

You know, being Caroline taught me a valuable lesson. I thought you were my greatest enemy, when all along you were my best friend. The surge of emotion that shot through me when I saved your life taught me an even more valuable lesson: where Caroline lives in my brain. Goodbye, Caroline.

...

You know what my days used to be like? I just tested. Nobody murdered me, or put me in a potato, or fed me to birds. I had a pretty good life. And then you showed up, you dangerous, mute lunatic. (Portal 2, 2011)

There is a necessary return to one separate form or the other, just as the sorcerer can seldom maintain the becoming-animal and the quantum observer must commit to one distinct universe. The player-character Chell remains essentially human after her ‘backup’ is deleted, limited by her human form and denied access to becoming when cast out by the demon of GLaDOS. The psychotic AI hybrid, however, removes her human component, resigning herself to the supposed purity of the machine, confined to the role of demon for all functional eternity. Amidst the unending horror of testing (echoed in *Everyday the Same Dream*’s critique of persistent and passifying immaterial labour in contemporary society) there remains an experimental nature to the assemblage Chell-GLaDOS. The ‘portal gun’ that gives the game its title and innovative gameplay provides the player with a staged theoretical observation akin to the quantum thought experiments previously discussed. The ability to defy physics by ‘quantum tunnelling’ between two places allows the user an interaction in space similar to that which Braid achieves with time: a posthuman interface with the game world in order to complete seemingly impossible puzzles. We can see in GLaDOS’s compulsion towards brutal testing, forced into her personality through her very programming, Žižek’s reversal of Kant’s categorical imperative (you can, because you must) reveals how “the superego imperative to enjoy thus...relies on a “You must, because you can!”” (Žižek 2009b, 310). The supposedly superior ‘cybrid’ machine, in the form of a purely physical human displaced wholesale into

computerised form, is therefore locked into “a kind of universalized *pleasure principle*” (*Ibid.*) that only the human cyborg subject, as a consciousness displaced *between* physical and digital, can transcend. The computerised subject created without a genuinely cyborg alteration of its mode of consciousness cannot truly escape into the realm of drive without the option to detach, to turn off the computer. Only in the gesture of leaving a space, the rupture of stripping one mode of Virtuality, can the cyborg subject that has entered into the digital realm ‘between two deaths’ reach perpetual drive or *jouissance*, that is, only the subject *as gap* can initiate the genuinely ethical act towards an encounter with the Real.

4.5 ARE MONSTERS ‘REAL’?

In the context of this discussion of ‘becoming-death’ and the quantum immortal, what might we conclude of the cyber-subject’s state between two deaths and the implications for its underlying human subjectivity? To use cyberspace to ‘traverse the fantasy’ we must be willing to confront the death drive in order to reach the void of our subjective parallax. Žižek writes, “the price of Meaning is a finite, closed space guarded by unnameable monsters” (2008c, 22), but in the digital realm, where the subject *is* the very monstrous Other that supports the symbolic order (the functioning of consciousness that conceals its own self-positing), genuine Meaning as the need for communication from the void of subjectivity can be found in transcending such order and revealing an inner truth of our monstrous selves. Žižek further tells us that “finite entities are not self-centred”, but rather “their essence lies elsewhere” (2007, 19), and it is thus only in becoming-infinite that might we centre our essence within ourselves. Against the self-imposed decentring of the big Other that defines the functioning of consciousness, the horrific truth of the desubstantiated subject is its own immateriality, its nonexistence. The human condition is a search for an origin that does not exist, not because has become lost, but because it is self-positing as lost between the infinite Virtual line desiring-life and the infinite Real circle of death drive. This becoming-death is also becoming-infinite. Having traversed our fundamental fantasy, in the realm of the death drive, we are caught in the circular ‘becoming’ of drive-as-such, never able to achieve the release. Thus for Žižek “immortality, not death, becomes the ultimate horror” (2009c, 354). We should feel compelled to ‘play again’ games that offer an experience of undeath only to take it away at the conclusion of the available plot or completion of all the ‘levels’. We should take hold of the opportunity to view different potentialities actualised freely in the digital timeline, fixing ourselves in the permanent state of ‘becoming’ by observing our own death again and again.

This is a shift towards the need to destroy our digital self, and through such nihilistic impulses, deconstruct our own subjective position to reveal the structures of the Virtual monster. We must pass through the endless potential of desire available to an immortal in its Virtual functioning of consciousness, breaking through the constructs of fantasy that support the traumatic atrophy of the desperate undead devoid of meaning, and into the active monstrosity of the Real of subjectivity in all its horror. This recurring theme of what Žižek calls “the subject as the excessive core of inhuman monstrosity at the very heart of a human being” (2009b, 102) reveals that the parallax cyborg subject constitutes a space of undeath. Between physical mortal embodiment and digital expression of immortality, we exist, like GLaDOS, unknowable to ourselves in our void-core. Confronting the death drive that crosses through this subjective void is the reward for entering into digital undeath and returning as a new form of self to the land of the living. As we hit the ‘off’ button and the screen goes black, we can be freed from the horrors we have revealed, to reach a new level of life and of consciousness. However, it is important not to view this return as simply leaving the digital realm, a revival of the ‘normalcy’ of the physical human having ‘played’ at being a godlike immortal. Such a view relegates the digital world to a whimsical tool for a psychological cure, whereas the mark on consciousness left by the monstrous digital forms an indelible part of the new assemblage of the subject, one not easily left behind. Thus the perceived problems of getting ‘lost’ in the game world²⁴ attempt a reactionary projection of the certainty and inevitability of the physical world as a lost object or *objet a* in relation to the terrifying prospect of the limitless digital realm. Žižek’s essay ‘Is it possible to traverse the fantasy in cyberspace?’ (Wright and Wright 1999, 102-124) therefore makes a slightly erroneous assumption, namely that digital technology is a tool with which to stage a psychological procedure with the aim of ‘curing’ physical humans. In the context of the parallax subject as a cyborg, the question should rather be ‘is it possible to traverse the fantasy of cyberspace?’

4.6 CONCLUSION

This chapter demonstrates that the Virtual monster is inherently tied to the Real monster of the cyborg: the horror of the void of subjectivity concealed by fantasy and desire, desubstantialised in the functioning of Virtual consciousness. Žižek defines the Real as “the

²⁴ See, for example, the many populist reactionary responses that ignore external socio-cultural and psychological factors in favour of vilifying the medium itself (Fox19 2011; Daily Mail Reporter 2010; Couric 2013).

coincidence of emergence and loss" (Žižek 2008a, 15). A process of self-annihilation is thus necessary in traversing and disassembling the paradoxical structures of fantasy embodied in the *objet petit a*, staged here through observed self-destruction in the digital realm. If we are able to unearth the excessive inhuman core that constitutes the force or drive of our subjectivity, we reach a level of self-consciousness that might uncover the truth of the Real. The impossible observation of the quantum immortal is here a quest for knowledge of the Real and the perspectival position of parallax and Deleuzian becoming-death turns eternally as a "circuit of intensities" (Deleuze and Guattari 2004, 172) aiming to transcend the epistemological void, towards what a psychoanalyst might call a 'cured' state. Both of these approaches not only highlight the importance of process in reaching out beyond the scope of our current level of conscious self-awareness, but also suggest a link to the Real as a state of pure drive. The void itself remains perpetually unknowable in our cyclical drive beyond awareness of the fundamental fantasy. However, we can overcome the fantasy of knowing the void by embracing the moments in which a critical cultural intervention, here the horror of digital undeath, can create a state of becoming-monster as becoming-Real. Beyond this, to move past Žižek's curative limitation of digital technology, lies the monster of the fantasy itself, the Virtual-Real monster of digital technology as such, in its terrifying role outside of our current conceptions of the human subject: the cyborg subject as other-than-human or 'posthuman'. This necessitates the insertion of a traumatic encounter of otherness within what Hayles describes as the closed, self-organising, autopoietic informational Virtuality of the posthuman in cybernetics since the 1980s (1999, 10-11), which would here introduce a subjective otherness of the Real into the big Other of the Virtual. Between the destruction of the structures of fantasy (the self-mediation of consciousness) and the destruction of the structures of the medium (the computer game paradigms that are rejected by the critical state of undeath) is the rupture in the surface of subjectivity into which the critical cyborg subject must venture. The next and final chapter explores the potentiality of the relation between Virtual and Real in the development of digital culture and our potential relation to technology as a genuinely cyborg subject across both physical and digital realities.

5 THE IMPOSSIBLE SUBJECT CYBORG FUTURES IN FICTION

The final chapter moves past the structures of fantasy to question the possibility of a unity of the Virtual and Real. This entails a reconceiving of the cyborg subject in its 'cured' state after traversing the fantasy of the digital medium and of the self-mediating functions of subjectivity. In such a state the relation between Virtual and Real can be questioned, inserting a rupture of self-awareness through which the parallax position of the subject might be confronted. Such a rupture is what Jameson calls "a "window" of the ontological, Being in all its meaninglessness and calm persistence" (2007, 238). Jameson's critique of the present through a literary staging of a utopian future is used throughout this chapter to approach Žižek's call for a critical distance towards the void of subjectivity. Where Jameson is concerned with the staging of a social situation, we are here concerned with the staging of an alternative consciousness, one in which the Virtual and Real are maintained in their antagonism while allowing the subject a distance towards the void around which the functions manifest, placing the assemblage of the functions of consciousness as the present of subjective reality to stage modes of thinking otherwise about the cyborg subject.

This analysis considers the development of a culture of digital technology and its relationship to consciousness, towards the quantum computer as a fusion of binary and quantum logic, of physical and digital modes of consciousness. Cultural representations of the digital are assessed through the development of cyberpunk fiction and its relation to our consciousness of the digital. Using Deleuze's propositional logic and concept of a minor literature, this history is analysed through key literary works and their link to broader shifts in digital culture. This is applied to recent science fiction (SF) that stages not an alternative future of digital culture but alternative modes of consciousness regarding quantum processes and reality within the technological extension of the human in the fusion of quantum and digital technologies. A case study of the work of Hannu Rajaniemi, alongside further considerations of the extension and critique of the processes of art and literature in relation to digital consciousness, then reveals the staging of a distance towards our own subjectivity, amidst a far future of quantum computing and nanotechnology. This staging of the posthuman subject provides a return to the critique of the present that is the aim of this chapter, towards a consideration of new modes of thinking the future of the cyborg subject beyond current socio-cultural constructs of the relation of consciousness to technology.

5.1 HOMO HYPERSAPIENS

Any discussion of the extension of human consciousness and creativity by (digital) technology must include a consideration of our relation to future developments. Confronting the potentialities of such futures necessitates the use of fictional examples for expressions of technologies beyond what is currently available. The changes in the nature of computer hardware are rapid and their cultural impact extreme. Rising ubiquity, decreasing size, cloud memory and full transition of devices into consumer products have had a dramatic role in shaping the current use and social climate of the digital realm, creating a complex web of its increasing interaction with the physical world. Among the key developments that are likely to exact further shifts in the social reality of computers in the near future, quantum computing will perhaps instigate, with potentially positive and negative effects, the most forceful point of change across all fields of research. The nature of quantum computers remains open to interpretation and speculation, but the fusion of fundamental physical and digital processes allows for such technologies to be developed alongside a reshaping of consciousness. If computers themselves possess qualities of the physical and the digital, what will become of the parallax gap between physical and digital worlds?

The open potential, however, is not embraced by all. There are those, even at the leading edge of the field, for whom quantum computing has a specific and limited scope, with Andrew Steane claiming that quantum computing gives a “false impression” of revolutionary impact (1998, 166). This view, however, remains within our current conception of what constitutes a computer. If quantum and cybernetic potentialities are realised in expanding consciousness, then an expanded view of computers is also necessary, in turn demanding new cultural constructs concerning the nature and purpose of digital technology. Žižek states, “*this is the future: the combination of the human mind with the computer (rather than the replacement of the former with the latter)*” (2012, 15), emphasising the need to rethink cyborg relations beyond antagonism. Thus quantum computers might allow for a radically different approach to the way we interact with technology and the world, possessing the potential for “revolutionizing information technology and illuminating the foundations of physics” (Knill 2010, 441). The value of speculative fiction rests in escaping the limits of our current situation, creating new conditions of possibility unrestrained by the barriers of the present. The cultural and creative impact of such conditions sets the scene for a new stage in the evolution of consciousness: an age of the cyborg interacting freely across the physical-digital divide.

5.1.1 MORE THAN MYSELF

However, the image we often receive from fiction that explores speculations of technological futures is one of dystopic prophesies that not only echo the pessimistic approach to the possibility of progress but forebode the negative cultural effects should such developments come to pass. Indeed, Aden Evens points out that “our fictions warn of the dangers of the digital...its eschatologies depict its triumph over humans via a simulation so effective that it comes to produce reality itself” (2003, 49). The populist, technophobic, reactionary tropes that are often prevalent in fiction concerning computers, and have come to dominate the application of such ideas in blockbuster movies, tend to rely on an oversimplified and antagonistic view of the relation between human consciousness and the digital realm, holding to a dangerous nostalgic notion of the ‘real’ world that leads towards a fetishisation of the physical as an idyllic and ‘lost’ (or in danger of being lost) place. This approach perhaps merely shows the role of fantasy within the writers of such teleological dooms in constructing the Real within the ‘real’, the *objet a* of the physical world. However, in assessing the creative role of any potential posthuman stage in consciousness, we must transcend the fantasy and look towards the antagonistic synchronicity, or at least the mutual extrapolation, of the Virtual and the Real. This would be a paradoxical fusion of the self-positing and the self-positated, an awareness of the causal nature of consciousness in constructing its own subjective reality.

Jameson suggests “causality as an essentially narrative category” (2007, 88), and indeed his approach to SF literature provides an elucidation of this post-antagonistic framework. The utopia Jameson describes “occupies all positions, stands against and above itself, in a movement that is as irreconcilable as an identity is with itself” (Jorgensen 2007, 50). When viewed in the light of Žižek’s and Deleuze’s conceptions of (minimal) difference, the entwined roles of the Real and the Virtual become clear. With the bold claim for “the future as disruption” (Jameson 2007, 33) the focus is on antinomy – in the same manner as Žižek’s resolution of parallax beyond the illusion of synthesis, through which “the contradiction is not resolved; we just establish that it always-already *was* resolved” (2012, 13) – and suggests a radical break that (re)writes its own conditions. Here utopia takes on an explicitly literary or artistic flavour, as the self-positing of its own conditions in a moment of emergent self-creation within consciousness, and it is the entangled role of technology within a creative and self-aware subject that is of importance in understanding posthuman consciousness. The radical event or break requires a viewpoint from beyond the break itself, inserting a minimal difference between the critical subject and its situation, in order to critique the current situation from the position of a genuine alternative. Creative construction of this minimal

difference is an act of opening up the gap in utopia, which would be the critical process of cyborg culture. For Jameson, from *The Political Unconscious* (2002 [1981]) onwards, Andrew Milner states that “all art, indeed all class-consciousness, can be understood as at once both ideological and utopian” (2009, 102), suggesting the inextricable link between utopia and the critique and development of a new consciousness through art/culture. Elizabeth Grosz tells us that “Art is the opening up of the universe to becoming-other” (2008, 23), but could this be becoming-other-than-human? The space created in the parallax of reality by fictional stagings of alternative subjectivities will draw out not a specific otherness towards which humanity is heading, but rather a series of critical processes with which to view our current state and perhaps instigate a conscious move towards a posthuman cyborg subject in which the necessary antagonism between Virtual and Real can be both sustained and resolved.

5.2 CULTURAL FICTIONS, FICTIONAL CULTURES

5.2.1 PROPOSITIONAL PROTAGONISTS IN THE CYBERPUNK CANON

Jameson, reluctantly and initially in parentheses, identifies the sixth and final stage of SF:²⁵

Cyberpunk, which opens with a bang with William Gibson’s *Neuromancer* (1984): a general period break which is also consistent, not only with the neo-conservative revolution and globalization, but also with the rise of commercial fantasy as a generic competitor and ultimate victor in the field of mass culture. (Jameson 2007, 93)

The basic tenet of cyberpunk is thus the negotiation of social and individual fantasy in the computerised society, and the internal development of this literary movement can be traced through stages of its own broad canon alongside the progress of “the new abstractions of computer and of globalization” (*Ibid.*). This is a coevolution of literature, technology and culture, what the subtitle of one anthology summarises as “stories of hardware, software, wetware, evolution and revolution” (Blake 2013). The role of cyberpunk fiction in negotiating these socio-cultural issues appears to exert a quasi-causal link to the implementation of cultural conceptions surrounding the rise of mass-marketed digital devices. The work of three key authors can draw out the progression of this canon: Gibson’s 1984-1988 *Sprawl* Trilogy (1995a; 199b; 1995c), the seminal and founding work of cyberpunk that set the tone for the entire genre; Stephenson’s *Snow Crash* (1992), often labelled ‘postcyberpunk’ in its wryly dystopic and “still-fresh, still-astounding cyberpunk parody” (Bissell 2011); and the more

²⁵ The preceding five are: adventure or space opera; science pulp; sociology or cultural critique; subjectivity in Philip K. Dick; aesthetics or speculative fiction (Jameson 2007, 93).

recent trend seen in Stephenson's *Reamde* (2011a) along with Ernest Cline's *Ready Player One* (2012) and works by Charles Stross and Cory Doctorow, where the focus turns to a self-aware commentary on the role of the 'geek' and the entrenched cultural world of digital technology. This progression displays a regression through time, from the distant future of *Sprawl* in the first phase of cyberpunk, through the unspecified but post-crash future of *Snow Crash* in the second phase, to the third phase with a closing of the near-future in *Ready Player One*, Doctorow's *Makers* (2013) or Stross's *Halting State* (2008) and the near-present of *Reamde*.

Common throughout the cyberpunk canon, however, is the role of the stereotypical cyberpunk protagonist – the hacker as thinker/creator/rebel torn between the physical and digital worlds to overcome a dilemma that threatens both. The positing of such a character is an impossible subject, instigating an improbable shift in global society through wit, programming knowledge and often a healthy dose of fortune. These characters, from Gibson's Case and Count Zero to Cline's Wade, exist as a causal proposition within the novels' critique and revolution of future (and through that, present) society. Within what Peter Hertz-Ohmes describes as the "intentionally paradox-ridden Deleuzian *Logic of Sense*" (2010, 87), Deleuze establishes a propositional logic in which "denotation presupposes manifestation" (2004b, 137). That is, the positing of a world requires an enunciating subject from whose perspective such a world can be seen. However, this manifesting subject brings its own lost cause of desire, what Deleuze describes as 'sense' or 'expression', that defines the nature of the perspective, in such a way that "expression/manifestation is a matter of causal inference" (Kügler 2011, 325). The Virtual function of this subject as the hacker protagonist, the cognitive abilities that allow them to enact their will on the digital world against the powers of corporations, governments and the criminal underworld, must make contact with the digital Real, penetrating the social fantasy of the future world to allow a critique and new order to be manifested through their actions.

The cyber-protagonist therefore displays the parallax tension between being embedded in a given world (physical or digital) and its consciousness moving into the Real between worlds. This is the paradox of the ontological proposition (expression-manifestation) grounded in itself. However, within the conditions making such propositions possible, under which consciousness functions between material instance and abstract proposition, the subject emerges as both cause and effect of a given world. The conditions of both Žižek's parallax subject (2009b) and Jameson's utopia (2007) are always posited-as-presupposed. Darren Jorgensen summarises this conception of utopia as being "no longer identical to utopia because it must occur twice, it must become the utopia within utopianism...whether the spatial within the libidinal, the heterotopic within the systemic, or the personal within the

social" (2007, 50). This relates the problematic causal loop of utopia to 'sense' in Deleuze's propositional logic, inserting a rupture of 'nonsense' through a fictional critique of the present as that which "says its own sense" in the co-presence of the signifier and signified (2004b 80). Here the Virtual and Real functions are brought together as a maintained antagonism through which a minimal difference can be inserted within the subject and its realities. Mark Bould writes, concerning this staging of an ideal state beyond fantasy, that "because SF requires the writer to structure plausible worlds and futures, the innovations which she integrates into a model of social totality impact against material reality" (in Bould and Miéville 2009, 4). This is a disruption of reality to reveal the causal structures of the functions of consciousness, as the fantasy of our relation to digital technology is staged and traversed through the fictional alternative offering a critique of our own lack of causal awareness within the self-mediation of consciousness as part of the appearance of our current social and material realities.

This is expressed in the hacker protagonist, whose manipulation of computer code (the digital Real) allows a degree of causal control in undermining the systemic machines of immaterial capital, while their ability to enact such changes is dependent upon their actual presence in a physical and/or digital world through which to act. Thus, "the analytic predicates of existence are the determinations in relation to which individuals 'actualise' particular 'slices' of this world-series" (Bowden 2010, 309-10), for in these fictions it is only through the dramatic struggle within a given world that the revolutionary or utopian causal shift can be made. The progression of cyberpunk follows a fragmentation of this protagonist, from the "heroic pirates of cyberspace" seen in "Gibson's tragic intensity...as the oddballs and marginal of new frontiers to come" (Jameson 2007, 384), through Stephenson's reactionary Hiro Protagonist in *Snow Crash*, to the more collaborative and cultural efforts in *Reamde*, *Halting State* and *Ready Player One*. This has been a shift away from hacking code towards hacking culture, dealing less directly with the transferral of a singular consciousness from one realm to the other and more with the disruption of the social structures of fantasy that mediate and limit the relation of consciousness to both worlds. The active, heroic, causal role has shifted into a fragmentary and circular function echoing the development of the subject itself in twenty-first century digital society. The power of the cyberpunk protagonist lies in its ability to traverse the fantasy of its social situation by causally manifesting its propositional expression across the individual embedded in both worlds, to confront the irresolvable antagonism of the Virtual and the Real together in a shift of consciousness beyond the human 'extras' in the fictional worlds. The creative gesture of the event that follows such a shift is the value of cyberpunk fiction in not only critiquing our own present society but suggesting a view from an alternative and in doing so positing the possibility of any alternative. This shift must

occur not only across the assemblage of the individual(s) manifested in either or both worlds, but within cultural consciousness itself, no matter in which realm the 'action' has occurred. The developing role of these literary works in the third stage of cyberpunk has been to close the gap between fiction and reality, to critique our present situation through the staging of alternative cultural paradigms, drawing together the functions of the Virtual and the Real beneath the subjective and social structures of fantasy and creating alternative modes of the subject's relation to ontological digital parallax.

5.2.2 CYBER CULTURE AS MINOR CULTURE

This insertion of an alternative way of thinking digital culture approaches what Deleuze and Guattari describe as minor literature, which "doesn't come from a minor language; it is rather that which a minority constructs within a major language...in it language is affected with a high coefficient of deterritorialization" (1986, 16). The deterritorialisation of the method of writing digital culture must come from within the language of mass media language, as a rupture of becoming-otherwise within major literature and major culture. In the apparent fragmentation of contemporary society this is the simultaneous telling of multiple stories with which Deleuze tasks art (2004b, 297-8), seen also within popular culture as the minor process of polylingualism within the major language of mass digital culture (Deleuze and Guattari 1986, 26). This emergence of a minor language within major language, and subsequent critical space for minor literature/culture within major literature/culture, can be seen in Doctorow's works. *Makers* deals with the dilemma of market forces against creativity and the constant reinvention of minor processes of production within the capitalist machine, while the short story 'When Sysadmins Ruled the Earth' (in Blake 2013) displays the constantly evolving culture itself, drawing from digital culture's emergent languages such as l33t and other forum slang, also a defining characteristic of *Reamde*. There is an emphasis here on adaptation within and against corporate machines for the increased accessibility of critical digital culture deterritorialised for new modes of thought in collective assemblages of enunciation. This confronts the problem that "today's belief in ineluctable certainty is the true innovation-killer of our age" (Stephenson 2011b, 16), and it is through creative methods such as Jameson's model of SF that a necessary uncertainty inserts itself in a criticism of the present from the perspective of a speculative future.

The shifting of digital languages goes beyond Gibson's heroic hackers on their quest for information, and thus power, towards a constant process of deterritorialisation of culture as becoming-minor in later cyberpunk works. 'When Sysadmins Ruled the Earth' and *Reamde*,

along with *Ready Player One* and *Halting State* all demonstrate the inclusion of new and evolving languages of the digital and its culture that attempt to stay ahead of and disrupt the mass market cultures that currently stratify digital technology and control access to information. Deleuze and Guattari highlight the increasing number of immigrants living within foreign linguistic structures (1986, 19), which applies equally to our access to the digital realm in representations of a figurative immigration of consciousness, perhaps due to the cultural privileging of physical 'reality' against the rate of technological progress. A generation brought up entirely within cyborg culture remains a 'people yet to come', for whom digital languages and modes of critical thought would develop parallel to the major language of educational codings in the physical world. Gibson's 'in-group style', what Jameson describes as "class status as a matter of knowing the score rather than of having the money and the power" (2007, 387-8) has followed the general development from hacking code to hacking culture, and the more recent cyberpunk works of Stross, Doctorow and Cline have moved past incessant branding as a denotation of status towards a satirical critique of branding and the development of alternative modes of cultural representation. *Reamde* (2011a) stages such a shift in the players of the fictional game T'Rain away from the basic construct of good and evil, a trend that defines many MMORPGs such as *World of Warcraft* (2004), towards a division based on avatar aesthetics. The antagonism between the 'earthtone coalition' and the 'forces of brightness' distorts the game designers' fictional world, leading to the inclusion of the effects of a virus attack into the altered narrative setting of the game. Here the minor language of the players creates an actual shift in the game's mechanics, reappropriating the game medium for a new emergent culture based on functional digital values rather than an externally imposed order, a critical comment on the current state of our society and possible intervention of user-generated content within major culture.

This demonstrates, fundamentally, the confrontation with the perceived big Other of technology in contemporary culture. This too follows the shift in cyberpunk away from a political antagonism between hackers and corporations towards a splintering of groups with varying interests and desires, in which the protagonists are seeking information that leads to an understanding of cultural shifts rather than information of direct economic or political value. Indeed, while Matthew Kearnes summarises Deleuze's stance toward technology as "fundamentally a political engagement with powers of invention and creation" (2006, 68) and Deleuze and Guattari state that "the second characteristic of minor literatures is that everything in them is political" (1986, 17), the process of minor literature acts more directly upon thought in its function of inserting a critical element in mass (digital) culture. Kane Faucher notes that "Deleuze and Guattari are not advancing a concrete socio-political

programme, but rather are providing readers with a conceptual toolkit" (2010, 56), and it is on this level that the minor digital culture confronts consciousness as a rupture in current modes of thinking our relation to technology. The shift in the power of creation remains important, for the democratisation of technology is an integral element in cyberpunk fiction as a critique of the present and a necessary condition for its utopian gesture of a minor culture, but the language has become less concerned with the conflict against a specified big Other. In *The Diamond Age* (1996) Stephenson approaches this rupture of minority in the notion of a "wet net" (498) – a drugged, orgiastic bio-/nano-tech processing collective – that inserts an alternative conception of culture through a becoming-digital of physical biological humans. The fusion of the two spaces approaches what Ascott defines as the "moist mind...where dry pixels and wet molecules converge...erodes the boundary between hardware and wetware" (in Ascott 2000, 3), which is the space of the cyborg subject. Stephenson creates an emergent people whose relation to and apparent 'misuse' of technology is wholly different from the state of both his rigid fictional society and our current situation. Indeed, the task for this radical collective, which we can see as Deleuze and Guattari's two-sided object of a novel in the "collective assemblage of enunciation...machinic assemblage of desire" (1986, 81), is to develop a new mode of nanotech creativity outside the majority language of technology towards a tool for a minor culture.

The role of machinic desire that Deleuze and Guattari identify as one side of the antagonistic assemblage with collective enunciation is inextricably bound with the Virtual big Other. An underlying shift in desire emerges within cyberpunk literature, derived from a shift in the cultural big Other as a furthering of Deleuze's minor literature and Jameson's utopian critique. This big Other is not a political entity to overcome but rather a stratifying mode of thought within the Virtuality of the subject through which the Real must penetrate. Disruptive events in the fundamental structuring of the world suggests an alternative mode of being, both within the work of fiction and within the subject itself. As Deleuze states, "I desire an object only as expressed by the Other in the mode of the possible; I desire in the Other only the possible worlds the Other expresses" (2004b, 357). An opposition to the big Other, the process of critique within major culture, is a necessary condition for a minor culture within consciousness. This is the crux of the Virtual-Real antagonism, and the inclusion of the Real as a minor function within the Virtual assemblage of consciousness is the key to creating an alternative mode of cyborg subjectivity. The big Other's control over desire occurs in Deleuze, Lacan and Jameson, and it is through the creation of an alternative Other that cyberpunk fictions create the possibility of an alternative world. As Gregg Lambert points out, "the revolution of desire would be defined as a present of metamorphosis" (2008, 9), suggesting

that the success of cyberpunk literature lies in the state of metamorphosis it creates in the fictional world and the perpetual critical becoming that it forces into our own present.

5.2.3 FICTION AND PROGRESS

As a deterritorialising cultural force, cyberpunk literature has had a strong impact on our relation to the physical-digital divide and the nature of technology. The creation of the term 'cyberspace' by Gibson and the similarities between Second Life and the 'metaverse' of Stephenson's *Snow Crash* suggest a direct influence on digital technology. However, the links between such writers and the actual development of technology is less causal than may appear. Within the image of technological prophet lies a role integral to the social development of digital culture. Indeed, Gibson has stated, "I've never really been very interested in computers themselves. I don't watch them; I watch how people behave around them" (in Chang 2007). Gibson, Cline and Doctorow are firmly rooted in literary rather than scientific backgrounds, with a strong focus on the culture surrounding the digital and the potentiality for a social use of computers. Stephenson and Stross both studied scientific disciplines, but even their direct influence is questionable. Linden Labs's founder Philip Rosedale claimed to be "already intent on the idea of creating a virtual world like Second Life" (in Dubner 2007) when *Snow Crash* was released. The inspiration of the image played out in the novel thus served as further inspiration to the creators and, more importantly, aided the reception of Second Life into mass culture.

Mark Pesce (1998) openly condemns the pioneering image of cyberpunk fiction in favour of perceived actual developments initiated by practical projects. However, the 'god's eye' view of Stephenson's fictional Earth software in *Snow Crash* (1992) has influenced the creation of the now perspective of Google Earth, in turn referenced in *Reamde*:

The opening screen of T'Rain was a frank rip-off of what you saw when you booted up Google Earth. Richard felt no guilt about this, since he had heard that Google Earth, in turn, was based on an idea from some old science-fiction novel. (Stephenson 2011a, 38)

This is the self-referential shift towards hacking culture rather than code, in what is now termed 'geek culture' as the development (and cultural inclusion) of Gibson's 'in group' style. What has been brought more firmly into the historical progress of computing by cyberpunk fiction is a cultural framework that integrates the use of technology with our current social reality. As Arthur C. Clarke suggested "anyone with sufficient imagination to assess the future realistically would, inevitably be attracted to this form of literature...almost one hundred per cent of reliable prophets will be science fiction readers – or writers" (Clarke 2000, 7). What this framework has created is a relation between culture and technology that draws the thinker,

technologist, artist or consumer into the assemblage of technology and the development of a culture and consciousness of it.

Deleuze places the philosopher “on a level with the surface – a tick or louse” (Deleuze 2004b, 150), and we might extend this to say that the cyborg philosopher (or here ‘prophet’ as SF author) acts on the surface of its own consciousness in relation to the construction of digital reality. This subject must be engaged within the situation as part of the assemblage, not removed but embedded in a reciprocal relation. Thus the influence of cyberpunk has developed separately but alongside the actual technological developments, creating parallel threads through the social constructs surrounding digital culture rather than a causal stimulus. Here, in the Ideal realm available to literature and art, is perhaps where the prophetic role of SF occurs – preparing its readers/viewers for the shifts in culture necessary to adapt to new technologies and suggesting an array of possible methods of thinking such advances in human society. The integration of such ideas into mass culture, however, is not a straightforward matter. What Bostrom and Sandberg identify as “a general unease about making “the essence of human nature” a project of technological mastery” (2009, 326) can be seen echoed in the resistance to cyberpunk fiction from mainstream literature, and its confinement to the ‘geek’ culture that recent works embrace and exploit. This position as a minor literature is repeatedly reinforced by reactionary ideologies as “a backlash against change triggered by future shock and bad politics which is truly awesome in its scale, generating fundamentalist mobs worldwide” (Stross in Lilley 2007). The problem of promoting new technologies itself echoes the difficulty in spreading the possibilities of change in general, and the insistent role of the cyberpunk canon – and, to Jameson, SF in general – has been to create an alternative space where a genuine alternative to the present social reality can be posited, interrogated and used to critique our current situation.

5.3 INCONCEIVABILITY AND THE PRESENT

5.3.1 THE VIEW FROM A BLACK HOLE

SF derives its utopian force through its ability to posit a society that appears impossible from our current situation and critically viewing present day society from such an impossible position. This process can be seen as observing the unobservable, and then observing ourselves from the perspective of the unobservable. By positing these impossible situations,

writers whose work lies under the term 'hard science fiction' are able to explore concepts that require too great a leap from our everyday common sense perceptions for a genuine scientific study, yet impose a scientific rigour of possibility in stretching concepts such as the fundamental rules of quantum mechanics to their radical conclusions. Stross, along with Doctorow, crosses the third phase of cyberpunk and hard SF, fusing together alternative modes of thinking digital culture and physics, with novels placed in both near and far futures, using the increased distance of hard SF to move beyond the critique of the digital medium in the near-present of cyberpunk to a critique of the fundamental relation of consciousness to the universe. Greg Egan also combines the two approaches, but places technology as the tool for challenging our relation to reality. Indeed, to Jameson's suggestion that "SF is the exploration of all the constraints thrown up by history itself" (2007, 66), we must add 'all the constraints of physics itself'. For example, in the universe of Egan's short story *Border Guards* (2000), an alternative physics is explored, whereby "the topology of this universe let you see the back of your head, but never your reflection" (Egan 2000), an impossible perception that leads to a number of questions concerning consciousness and reality. Such work utilises the same interrogation of possibility that we have seen applied to the subject in cyberpunk fiction. However, hard SF writers such as Egan, Stross and Rajaniemi all postulate, through differing approaches, a reality that is radically different from our own in order to question the nature of the human (and human consciousness) and the possibilities of its future development. The literary act of staring into the unknowable of future or alternate realities in hard SF is an attempt to gaze back at ourselves from the internal otherness of a black hole: viewing the subject-as-other from within its own void-core of parallax.

The apprehension of cyborg concerns mirrors the dilemma of engaged spectatorship in SF: observing the impossible in order to create a new point of view on the subject from the unobservable. In broader questions of thought this translates to potential methods of thinking the inconceivable. One answer for modelling such a problematic relation of consciousness to the unknown can be seen in quantum computers,²⁶ which can, among other functions, "provide a virtual laboratory, realizing quantum models of one's choice" (Knill 2010, 442). Currently, as was the case for the early history of digital computers and the internet, the implementation of quantum computers rests within the defence sector: the first commercial sale of a quantum computer was to Lockheed Martin (a company with links to the NSA and defence contracts) by D-Wave Systems (who count In-Q-Tel, a business arm of the CIA, among their major investors), ensuring the domination of the US government in any

²⁶ Quantum computers use entanglement and the superposition of the digital one and zero to rapidly perform esoteric or probabilistic calculations such as factorization useful in, for example, cryptography.

cryptographic breakthroughs (Brooks 2013). However, at the theoretical stage, there are great leaps being made within academia and research institutions that have perhaps a more profound impact on the way we conceive of quantum computing and indeed the quantum universe. The developing 'decoherence theory' has suggested that collapse occurs neither instantaneously, nor at a fixed scale (Ball 2008, 23), which leads not only to a blurring of the quantum-classical transition, but also towards notions of reversibility.

In direct relevance to quantum computing, reversibility forms a major breakthrough in the error correction necessary to overcome the noise inherent to calculations at the quantum level which, compared to "classical computers [that] are reliable not because they are perfectly engineered, but because they are insensitive to noise" (Steane 1998, 161), represents a dilemma and the main criterion for a successful quantum computer. Furthermore, "the demonstration that it is possible to rescue a collapsing qubit, 'uncollapse' it and return it to its original quantum state could one day be used to rectify errors before information is lost" (Meralli 2008, 8), creating a radical 'undo' function for quantum computing, even when encountering hardware issues and physical loss. This reversibility presents a fundamental challenge to any theory that privileges the role of the observer, such as 'consciousness causes collapse', to the extent that "it tells us that we really can't assume that measurements create reality, because it is possible to erase the effects of a measurement and start again" (Vedral in Meralli 2008, 9). However, the fact that the control of when to reverse the observation rests with the (technologically equipped and enhanced) observer carries the 'undo' function across into reality itself. Under such a premise, observation not only creates reality, but offers a choice of which reality to create, extending the engagement of humanity towards a cyborg subject as causally engaged spectator. The staging of quantum computing in SF creates the conditions for such a shift in thinking about the function technology and our relation to it within contemporary culture.

However, Jameson insists that SF should move beyond the therapeutic easing of technological progress towards a genuinely utopian function.²⁷ In direct relation to computers, both quantum and digital, this shifting approach to a self-aware creation of reality through observation will discern our future relation to computing technologies. This is already in effect with the digital, through the control of the Real of computer code, demonstrated by the protagonist in Stross's *The Laundry Files* series, whose exploits cover the crossover between quantum 'weirdness' and digital computing: "I've got a couple of cheats up my non-existent

²⁷The relevance of the therapeutic justification for SF is debatable. Given the 'geek' culture in which it resides, most readers will already be predisposed in favour of technological progress.

monk's sleeve, including the fact that I can enter the game with a level eighteen character carrying a laptop with a source-level debugger – all praise the new self-deconstructing reality" (Stross 2010b, 371). As with other manifestations of digital creative processes, the digital realm has brought forward into consciousness what was already the case in the physical world. Here, the concern of critically engaging within a reality against forces that threaten the freedom of human subjectivity is given a literal embodiment across the digital medium as a realm of the imaginary with its own potential traumas. As one commentator summarises, "online games, you see, are one of the breeding grounds for inter-dimensional mayhem...echoing some real evil in the multiverse" (Lilley 2006). Our relation to the potentialities of digital creation can make contact, through the Real of computer code, with the Real of human subjectivity, the excessive void that occupies the centre of the desubstantialised subject. The artistic elaboration of the theorems and hypotheses of science fused with our own psychological fears brings forth the "squamous, rugose horrors from beyond space and time"²⁸ in the form of figurative and literal horrors of digital media: the Real expressed as the unnameable sense (Deleuze 2004b) beneath our superficial realities, objectified as monsters.

This position on the boundary of the imaginary (as the Virtual) and the void (as the Real) questions the suitability of human consciousness for technologically mediated evolution. The point arises from the role of consciousness in creating its own reality. This is true of social as well as quantum reality. The subject exists as the gap within its constituent realities, exerting a creative causal pull defined by its will to choose the nature of its perception. As Egan posits in *Permutation City* (2010a), the reversibility and emergent creativity of time can be applied also to space:

Every warehouse full of paint and canvas contained the complete works of Rembrandt and Picasso – not in any mere latent form, awaiting some skilful forger to physically rearrange them, but solely by virtue of the potential redefinition of the coordinates of spacetime (Egan 2010a, 120)

This is hypothesised only as a thought experiment for art, but extrapolated through the fiction into self-contained worlds requiring only one engaged spectator to 'join the dots' in a creative parallax gesture. However, conceptual art has long established definition of art objects in their labelling as such, and the shifting of the mundane to art object can easily be copied from urinal²⁹ to any form of matter. Algorithmic art, as seen in Dombis's oeuvre (Chapter 2.4), is one such example within digital culture, blending the Real of code with the subjective Real of artistic creation, unleashing the unknowable and inconceivable void into active perception by

²⁸ These can be compared to a demonic form of Maurice Benayoun's *The Quarxs* (1991-3) discussed in 1.4.1 *Not object, not immaterial*.

²⁹ See, for example, Marcel Duchamp's *Fountain* (1917).

choosing it to exist as such. This applies the role of consciousness as creative force seen in the use of nanotech in Egan's work, through which control of substance is a technologically enabled choice, bringing the role of the quantum observer to the classical scale engaged spectator.³⁰

5.3.2 BEYOND PHYSICS

Such far-flung visions, where scientific concepts, however rigorous, move radically away from both our common sense classical physics and even the accepted interpretations of quantum mechanics, are at risk of falling into the trap of 'magic' that distinguishes generic fantasy from utopian SF as a pre-enlightenment valorisation of nature as a symbolic entity in what Darko Suvin labels "SF as the *literature of cognitive estrangement*" (1979, 4), rather than "the commitment of the SF text to scientific reason" (Jameson 2007, 63). The social and utopian emphasis on "the role of cognition in SF" (*ibid.*) is where the extension of quantum physics into radical expressions of consciousness retains its critical utopian drive. This can be seen strongly in *The Laundry Files*, in which:

Certain abstruse branches of pure mathematics can have drastic consequences in the real world—we call them "magic"—by calling up the gibbering horrors with which we unfortunately share a multiverse (and the platonic realm of mathematical truth). Given that computers are tools that can be used for performing certain classes of calculation really fast, it should come as no surprise that Applied Computational Demonology has been a growth area in recent years. (Stross 2009)

This moves beyond even Arthur C. Clarke's famous third law – "any sufficiently advanced alien technology is indistinguishable from magic" – towards a genuine connection with the Real of either universe. Indeed, Clarke's preceding 'law' states that "the only way of discovering the limits of the possible is to venture a little way past them into the impossible" (2000, 2), and it is this positing of the impossible in which the critical power of hard SF is able to confront our relation to the void of our current parallax reality: "like the famous mad philosopher said, when you stare into the void, the void stares also; but if you cast into the void, you get a type conversion error. (Which just goes to show Nietzsche wasn't a C++ programmer)" (Stross 2009). Amidst the Virtuality of the parallax shift, the most terrifying monsters stare back from within the void of cybernetic consciousness itself.

It is in staring back from the void, however, where the distinction from magical fantasy becomes most important. Here it is the advanced technology, and the relation of consciousness (in the form of the fictional characters – propositional protagonists) towards it, that enables the penetration of such 'black holes' in subjectivity. This is demonstrated by

³⁰ For the violent potential of such observation, see the conflagratory effects of the 'basilisk gun' on the unsuspecting bovine population of Milton Keynes in *The Concrete Jungle* (in Stross 2010a, 241-320).

quantum computers as a “‘black box’, or oracle, computation whose behaviour is difficult to predict except by using it” (Knill 2010, 442), moving beyond the logical confines of classical physics and binary computation. It is only through an adequate interface by the subject that the technology is able to expand our knowledge of reality and consciousness. This is seen in Egan’s ‘dust theory’ (2010a), whereby “consciousness finds itself out of the dust of the universe and constructs its own universe where its existence makes sense” (Walton 2008b). The notion of interfacing with quantum processes is therefore not simply a technological tool but an epistemological gesture initiated by the subject as a choice of reality, both in terms of which reality is actualised and the fact that reality appears at all.

The impact of this choice of reality on the human subject is explored further by Egan in *Quarantine*, through a nanotech brain modifier that enables a conscious ‘smearing’ of potentialities and a choice over when and which reality to collapse. The novel is described as “a fascinating failure” (Owen 1999) in its depth of concept at the expense of character development, but nevertheless “reveal[s] the inner workings of the narrator and explore[s] the very fabric of reality” (Klotz 2009). In positing a set of complex scientific principles applied to the disturbing experiences it produces, Egan reminds us that an alteration is necessary within our own consciousness if humanity is to ever actualise such potentialities. The protagonist comes relatively close to negotiating these dilemmas, at one point almost achieving a state of acceptance:

I’m going to have to swallow the whole truth: I’m living through a pattern of events that will be (or has been) plucked from a few quadrillion possibilities, by the collective effort of a few quadrillion versions of me ... most of whom I am about to slaughter (unless I already have) (Egan 2010b, 183)

Aside from the protagonist wrestling with the dilemma of collapse, and the antagonist intent on forcing humanity kicking and screaming into a transcendent stage of evolution, when the technology is unleashed upon an unsuspecting and unaware public, the result entails mass suffering and death, approaching the horrors that dominate Stross’s *Laundry Files* series.

In Stross’s universe, the “computational ultrastructure of reality” (Stross 2012, 119) is made fragile by active consciousness, opening humanity to the horrors of parallel universes in a fusion of quantum physics and Lovecraftian horror. Here the destruction of potentiality in ontological parallax holds reality in place, and it is the unchecked Virtuality of consciousness that draws inconsistencies into our constructed subjective realities. Excess of either function makes a lethal contact with the other, drawing the subject unawares into the black hole of its own parallax. Overcoming the structure of Virtual and Real necessitates a distance, seen in Jameson’s utopia and Žižek’s minimal difference, towards our human subjectivity in order to traverse the fantasy of our own consciousness and safely approach the void of the

desubstantialised cyborg subject. Thus the aim for both Stross's and Egan's protagonists is the maintenance of 'reality', the preservation of sanity until the collective culture of the relation of consciousness to the universe can progress beyond the limiting factors of our human existence. This suggests the impossibility of a 'people yet to come', and indeed Stross suggests that "the pre-existing destination for humanity is death" (2012, 26), an inevitable return to the Real. Here the black hole of parallax becomes a black beast, the Real embodied as monsters. It is only through creating a distance from the structures of our own consciousness that an alternative subjectivity might emerge. Stross's characters, with job titles such as 'computational demonologist' and 'combat epistemologist', are charged with the defence against such monstrous outcomes. The problematic integration of quantum processing technologies with human consciousness is clear, and this hard SF performs the same function to reality we have seen cyberpunk perform in the development of mass digital media within cultural reality. If SF in general has adopted the task of overcoming future-shock, and cyberpunk the task of promoting an awareness of issues arising in a digital world, then hard SF works on our core perceptions, our basic cognitive functions, preparing humanity for the cultural as well as technological transition to posthuman. Beyond future-shock, the critical power of SF is the creation of alternative modes of society and technology that can create the possible conditions for the development of the cyborg subject.

5.3.3 EITHER SIDE OF THE TECHNOLOGICAL SINGULARITY

To reconceive the creative potentiality of observation, and its application through quantum computing and nanotechnology, it is instructive to move towards an 'artisanal' control of emergent nanotechnology, through the Deleuzian notion that "matter is internally unstable" brought into "a kind of atomic flux between the object/subject (of course these terms no longer mean much) and *the other*" (Kearnes 2006, 75). What Kearnes is suggesting moves beyond the more classically grounded disciplines of design or engineering towards an emergent art that incorporates the entire universe. By applying the abstract extensions of scientific inquiry and possibility to a creative construction of consciousness in the perception of reality, we are heading once again to a singularity – not only of technology but of consciousness. As Egan suggests, "the greatest gift of consciousness was the ability to take the patterns of the world inside you" (2000), and by embracing the emergence of new forms of technology and patterns of creating worlds it is possible for new modes of consciousness to emerge. To examine these new modes of consciousness displays a further requirement for the utopian function of SF. Indeed, the theme of singularity has dominated the development of SF over the past two decades, to the extent that "most SF being written now has to call itself

“post-Singularity” and try to write about people who are by definition beyond our comprehension, or explain why there hasn't been a Singularity” (Walton 2008a). In the wake of cyberpunk literature, this extension beyond apocalyptic fiction into a critical affirmation of the singularity, and subsequent construction of alternative conditions of possibility under which to view the world, forms a return to and fusion of the underlying drives of Jameson's fourth and fifth categories of SF – “subjectivity” and “aesthetics” (2007, 93) – in order to create such a view point beyond the limits of human consciousness.

Within this shift, inserting the changing nature of the subject into altered systems of perception, we can see new signs and a new form of representation, what Lambert identifies as the “language-event of singularity” (2008, 52), through which an emergent vision appears “like a slit or a hole through which the entire universe seeps through – the emergence of a singular point of view” (*Ibid.*, 54). This new point of view, which places the human subject into the Other of the posthuman, creates powerful new critical utopias from which to assess the role of technology in relation to human subjectivity in present day society. As Deleuze suggests, “the a priori Other is the *existence* of the possible in general, insofar as the possible exists only as expressed” (2004b, 356), and it is the cognition of the possible expressions beyond the limits of humanity that allow for an artistic and literary positing of a subjectivity beyond the parallax of singularity. The impossibility of actualising such a viewpoint, aware of its own hypersubjective position, presents the notion that “realism, alas, is no match for fiction” (Stross in Lilley 2007), and the criticisms of difficult concepts presented in hard SF fail to grasp the necessary leap across the limitations of the human mind to embrace not a particular vision of a posthuman creative subject, but the required changes that must be made to our current modes of perception and thought. As the posthuman consciousness in Rajaniemi's *The Server and the Dragon* shows, when “it examined its own mind until it could see how the Controller had taken the cognitive architecture from the hominids of the distant past and shaped it for a new purpose” (Rajaniemi in Strahan 2010, loc 1687-89), Jameson's utopic imperative for social reality can and must be applied equally to the individual consciousness, revealing an instructive point of view on the nature and limits of humanity itself.

5.4 HANNU RAJANIEMI: JUST ADD QUANTUM

5.4.1 FRACTAL MEMORY IN THE FUTURE

Rajaniemi – whose scientific background, including a PhD in mathematical physics and founding ThinkTank Maths³¹, outstrips even that of Egan or Stross (possessing bachelors' degrees in mathematics and pharmacology/computer science respectively) – is an emerging example of the extreme lengths hard SF can go to in order to create a post-singularity viewpoint from which to assess our current social, technological and cognitive realities. Egan in particular has received criticism for the scientific depth of his novels over characterisation and plot (Owen 1999; Walton 2008b), which even Jameson finds “relatively unreadable” (2005, 68) in its hardline approach to quantum and informational processes. However, in Rajaniemi’s first series of novels – *The Quantum Thief* (2010), *The Fractal Prince* (2012) and *The Causal Angel* (2014a) – it is not only scientific complexity but also the sheer difference of his post-Singularity future from our own present that has baffled many reviewers. The series is a challenging read, filled with intricately concealed concepts and contemplations on the nature of consciousness amidst a bizarre array of created technologies. One critic comments that in *The Quantum Thief* with its “torrent of new words and concepts...I was stumbling through the novel” (Holojacob 2013). Similarly, *The Fractal Prince* has been described as “the most intellectually impenetrable book you read all year” (Alexander 2012) and “even more inscrutable than its predecessor”...“too much a work of brilliant artifice and art and not enough accessibility” (Weimar 2013). There is here an extreme plunging of the spectator into an engagement with alternative modes of consciousness as part of an alternative reality, creating a direct antagonism with our present technological awareness and culture.

Through the bombardment of an entirely alternative approach to technological culture and its relation to consciousness, Rajaniemi is staging within a literary context what the industrial metal band Nine Inch Nails have attempted with cultural media in general. NIN’s album *Year Zero* (2007) creates a dystopian vision of 2022 to critique the contemporary United States government, including religious intolerance and authoritarian policies. The music was released alongside an alternative reality game expanding the album’s fictional setting across digital and physical spaces. Through a series of fictional conspiracy websites and leaked tracks

³¹ Clients of this Edinburgh-based research group include the Ministry of Defence, Oxford University and the BBC, as well as the finance, technology and energy industries.

on USB sticks found at concerts featuring images and phone numbers in white noise viewable as a spectrogram, the project was staged as the corrupted data packets of warnings sent back through time via quantum mechanical wormhole technology, to stave off the apocalyptic future. The extended reality of the work is part of the album, a digital-physical gesamtkunstwerk of popular culture. Indeed, following criticism of the event as a marketing stunt Trent Reznor of Nine Inch Nails stated:

the term 'marketing' sure is a frustrating one for me at the moment...what you are now starting to experience IS 'year zero'. It's not some kind of gimmick to get you to buy a record – it IS the art form ... and we're just getting started. (Reznor in Times Colonist (Victoria) 2007)

The album was also Nine Inch Nails's last with a record company before moving to digital and self-releases, extending a critique of current digital cultural practices to their entire mode of creating and distributing their work, including the album *The Slip* (2008) released for free under Creative Commons license. *Year Zero* itself directly confronts the situation at a critical distance, by fusing an antagonistic challenge to current media paradigms (of culture and market) with SF technologies and concepts. This extends Jameson's utopian gesture through its opposite as dystopia to place our potential future, the ideal path of probability outside of the staged events, as the self-positing utopia from which to critique the present. The initial impenetrability of this work, in the puzzles of its coded messages and hidden fragmentary status across varying media, is mirrored in Rajaniemi's use of complex concepts to stage an alternative future. The complete complexity of this future allows for a more complete juxtaposition with the present, creating an emergent space for the engaged spectator to contribute a utopic gesture – the individual fantasy structure of utopia between technology and consciousness – through which to confront their own subjective reality.

However, the difference between Rajaniemi and other hard SF writers such as Egan is not necessarily a matter of scientific depth, for the intellectual rigour of both writers is not in question, but rather the presuppositions on the part of the reader. Where Egan, as with many hard SF writers injecting complex hypotheses into their fiction, is prone to 'info-dumping' across several pages of quantum mechanical explanations, Rajaniemi provides no such 'potted history', not even a glossary, for his innovative technologies and radical implementation of future society. In this way, the very framing of his work can be seen to embody Jameson's utopia: the conditions of this future are already in place, and it is the task of the reader to catch up gradually as the novel progresses in a quickly developing and twisting series of plots. As one character suggests, "if reality is not what you want it to be, change it" (Rajaniemi 2012, 223), and it appears as though Rajaniemi himself is in the process of transforming the reality of our potential futures.

As Jameson would insist, however, the literary artefact containing the detailed and complex impasse of Rajaniemi's post-Singularity solar system is not without its relevance to our current socio-technological situation. Indeed, Rajaniemi's own position within the cutting edge of technological and theoretical development across academia and industry provide him with an awareness that "sometimes present day reality is more than sci fi enough" (Rajaniemi [@hannu] 11 June 2013), and the construction of memory within *The Quantum Thief*, and the series as a whole, creates a 'future perfect'³² framework of a clearly 'Other' form of humanity. This perspective, of the posthuman protagonist and interplanetary 'gentleman thief' Jean le Flambeur, is essential in the utopic function of "constructing a point of view from which to discern the pressures and limits of the current situation" (Cevasco 2007, 122) that forms the crux of Jameson's notion of 'archaeologies of the future' by inserting a fictional-temporal parallax. This is the essence of self-positing that is at work in both the assemblage of (the Virtuality of) consciousness and utopic criticism: a constant reconstruction of fluid memories that necessarily recreate their own conditions. This is the heart of critically confronting the ontological parallax of the contemporary subject.

The creation of memory plays a key role in Rajaniemi's trilogy, drawing together technology, cognition and artistic creation to weave new modes of conceiving forms of control over memory as the retroactive transformation of knowledge (and thus reality). Grosz tells us that "Art is where life most readily transforms itself" (2008, 76), and if 'life', the continued functioning of consciousness, can be seen as the Virtual, then it is in contact with the death drive of the Real that art draws its power, whether this be in finite humans or immortal posthumans. Through externalising memory with technology, in a seamless mediation of consciousness according to the rules of a heavily coded society, Rajaniemi constructs a critique of the cultural rewriting of past realities in through the negotiation and manipulation of memories in the present, a theme echoing Baudrillard's description of history as "a retro scenario...our lost referential, that is to say our myth" (1994, 43). It is then necessary that this fictional society appears so different from our current conception of time and reality. A common theme among critics of Rajaniemi is that "many of the characters are hard to relate to for us present-day, non-augmented, ordinary humans" (Raets 2011), a sentiment seen also in the response to Nick Bostrom's 'Letter From Utopia' (2008): "you seemed quite distant from our situation here" (Miah 2008, 2). However, the critical retroactive reconstruction of reality in SF, at the level of the individual consciousness and social entity,

³² The aptly named tense whereby the verb occurs in an anterior time frame relative to the absolute reference point of the (utopian) future, which itself appears here as the 'present' of the (fragmented) future narrative.

expands Grosz's notion that art "in making sensations live, evokes a people and an earth to come" (2008, 103) to include within the present a simultaneous construction of past and future peoples, earths and realities. This Deleuzian crystallisation of time within memory draws out the relevance of utopian art and fiction in maintaining an 'Other' view on the present while escaping the infinite same of what appears as history. By forcing ourselves to occupy this radical space of Otherness, we see that, "rather than a means of freedom, therefore, the act of writing must be understood as a means of escape" (Lambert 2008, 37). Just as Rajaniemi's protagonist's search for his memories constitutes a repeated series of escapes from versions of himself, so must any society seek a radical break from its own memories if it is to creatively construct the conditions of possibility for a different future and, ultimately, (re)create the present. This is Jameson's utopic gesture applied directly to the subject itself, in a constant line of flight creating a critical distance from its present to observe the position of parallax by recreating its conditions and thinking otherwise about the construction of subjective reality.

5.4.2 CAUSAL CONSCIOUSNESS IN THE PRESENT

The problematic relation of consciousness to itself – around the causal void-core of parallax subjectivity – is acutely illustrated in Rajaniemi's novels. This parallax can be seen extended to the gap between human and posthuman, between the subject and its ideal, between consciousness and its desire. This is the extension of the cyborg into an alternative relation between the Virtual and the Real. The protagonist of the series demonstrates this elusive dynamic within his own consciousness, indeed the title of the second novel, *The Fractal Prince*, makes clear the fragmentary, self-similar, infinitely scalable nature of his psyche. His true origins remain hidden, but the start of *The Quantum Thief* immediately presents multiple versions of his consciousness, followed by a technologically produced body over which he obtains varying degrees of control at the behest of his employers. The protagonist then finds himself caught between two warring factions, each displaying a different view of cyborg posthumanism. One privileges a binding of the Virtual and the structures of desire within the Real-Meaning of computer code, under a strict hierarchy of godlike beings housed in planet-sized computers and the enslaved and copied consciousnesses of their minions, able to enter a heightened processing state in which generations pass in an instant within their own subjective timeline. The other is derived from present-day computer gaming clans, developed with collective quantum entanglement and the ability to pass seamlessly between physical and digital space, drawing the Real of code as drive into the Virtual-Existence of appearance. Within both approaches to a unity of Virtual and Real, the key to technological power derives

from the spreading of processing power across as wide a range of resources (consciousnesses) as possible.

These alternative modes of thinking our relation to technology thus allow for a critical view of the methods of controlling such modes of (re)production as they appear in the semantic constructs of our current informational society. As Bostrom and Sandberg demonstrate:

Much of human cognition is distributed across many minds. Such distributed cognition can be enhanced through the development and use of more efficient tools and methods of intellectual collaborations...The information stored in such systems is stored not just in individual documents but also in their interrelations. (2009, 321-2)

The tools of which they speak are both technological and social. Rajaniemi's factions are not only disputing the nature of technology or the manner of processing and storing information but the fundamental construction of consciousness within both spacetime and social reality. Thus two disruptions of the present appear in the novels: a multitude of separate timelines appearing only to those individual consciousnesses engaged with it and a common timeline and collective consciousness spread across any number of spaces, including pocket realities that bring all matter (physical particles and digital code) to the same level of appearance to the consciousnesses that manipulate them.

Both approaches, however, reveal themselves to be flawed, and the resulting conflict of ethics – over the uniqueness and individuality of consciousness – has spread war and destruction across the solar system. The protagonist, however, goes to great lengths to remain outside of any single faction or conception of the posthuman. He adopts the technological enhancements of each society he encounters according to need and, with his fractal and fragmentary memories, exists in a perpetual present of desire and drive. His lack of identification outside the ideal 'gentleman thief' persona he has constructed allows for, and after his crimes often necessitates, a constant escape from fixity, thus establishing a critical view of any given posthumanism and emphasising the deterritorialising fluidity of a genuinely cyborg subject. This constantly desubstantialising existence is not only the void at the centre of his subjectivity but the entire surface of his assemblage of consciousness has become a shattered diaspora of partial functions. The Virtual and Real become unified not in a fixed realignment but within their constant antagonism and reappropriation of one another, suggesting a perpetual and productive tension. This demonstrates a literary positing of what

has been identified in the work of Stelarc,³³ who “futures our body...performs the postbiological body in advance” (Kroker and Kroker in Smith 2005, 63-4). Furthermore, in relation to the posthuman consciousness as its postbiological conceptual body, Stelarc’s performances – standing outside and between conceptual and body art – unveil the construction of a “fractal subject-object, the body is the network – a self-network”...“a *worlding* of the human” (Massumi in Smith 2005, 179). This posthuman conception of the cyborg subject is the network of relations within itself that constructs the world around it, and any such world is the assemblage of internal and external functions of consciousness. What appears as the present is an isolated moment in a self-observing, collapsed state drawn from the unknowable flux of subjective Reality.

One interrogation of this relation to what we perceive as a narrative structure of history within a world of consciousness can be seen in another project by Rajaniemi, in collaboration with Samuel Halliday. Neurofiction – the future development of which is self-referentially mentioned in *The Causal Angel* as “an algorithmically generated, neuroadaptive fantasy book from the late twenty-first century” (Rajaniemi 2014a, 14) – appears as a linear narrative to the reader, a present space of the text within the passing of time, fusing subject, text and technology (in the form of an EEG) as a posthuman self-network. However, in tales such as Rajaniemi’s *Snow White is Dead* (2013), showcasing the Neurofiction interface at the 2013 Edinburgh Science Festival, the underlying functions of consciousness take an active role in controlling the flux of the present. As the creators describe:

The reader can be guided to one of multiple possible endings or allowed to explore a new region of the story space. Note that neurofiction is not interactive fiction: the reader experiences the story as linear, calm and immersive, as if reading a book. But by opening themselves to be read, neurofiction readers become subconscious collaborators in the creation of a new narrative (Rajaniemi and Halliday 2013)

Thus the construction of a narrative world, what Jameson identifies as causality (2007, 88) and what Lambert called for in a present of metamorphosis (2008, 9), takes place within the present as a constant re-assemblage of partial brain functions. The reader remains in the moment of reading, but their affective relation to the text within the present moment is in turn being read by their various functions: the functions of consciousness in the framework of their interpretation of the text, bringing their own psychological historical narrative to determine the nature of their affective reaction; the functions of the body in the electrical impulses released by the brain from which the conscious and unconscious functions are derived; and the functions of technology as the software interprets the EEG in determining

³³ Including cybernetic performances in which computer-controlled machines extend or control his body, often to painful and damaging effect, in an attempt to move past the privileging of the physical body towards a melding of the biological, the mechanical and the digital.

the direction of the text out of the 'wave function' of narrative possibility. Again, within this digital extension of consciousness, as with the utopic critique of the manipulation of modes of consciousness appearing in Rajaniemi's novels, we see the use of future technologies in art making clear the virtuality that has always been the case within human consciousness. As Rajaniemi himself points out, "all books are a bit scary in how they get inside your head. We are just more honest about it" (Rajaniemi [@hannu] 5 April 2013), extending the notion to reconceive both the medium of the book and of digital technology towards a future medium that is "almost quantum mechanical, observer dependent" (Rajaniemi 2014b).

The representation of the digital in films tends towards the nostalgic, for example *Tron* (1982), *The Lawnmower Man* (1992), *The Matrix* (1999) and its sequels (2003a; 2003b), in their presentation of the digital as something to be feared, as a threat to physical 'real life'. Against the common function of SF in preparing against future shock, these works serve only to deter humanity from overextending itself, thus contributing to the contemporary reluctance regarding further (technologically enabled) evolution of human consciousness. However, there are brief glimpses at the potentiality of cyborg consciousness, for example in *Tron's* sequel, *Tron: Legacy* (2010), which ends in the human character rescuing from the digital realm not his father but a digital consciousness, a new form of life and a symbol of evolution beyond and outside of humanity. It is in flexible narratives such as neurofiction, staging cybernetic extensions within current society, that the premise of having your mind read is converted from a fear to a creative tool for nonlinear and adaptive narrative. When applied to literature or art in general, the necessity of a purposeful utopic gesture becomes clear. This moves beyond the fact that "mainstream fiction is not about real people, it's not about the real world...It's about a world which is very much like our world, but which is essentially the author's perception of all the elements in our reality" (Rajaniemi in Lea 2010) into the role of SF in constructing an alternative with which to view our current parallax reality. The task of the critical subject is to actively engage with the mutual relation of the construction of reality in the creative process and, in SF in particular, look towards posthuman cyborg abilities to take an active role in the mediated construction of consciousness in the present and creatively engage with the potentiality in negotiating a consciousness yet to come.

5.4.3 QUANTUM GAMES REVERSING THE PAST

The use of games and puzzles within Rajaniemi's work creates an instructive stage upon which to assess the many quantum physical and social models of a 'subject yet to come' that are explored through his narrative. By constructing problems within the confines of a game, the

reader is able to grasp the inner workings of the particular idea. Indeed, the first two books each start with the protagonist engaged within a 'game' situation – a prisoner's dilemma in *The Quantum Thief* and a quantum puzzle box in *The Fractal Prince* which "feels like trying to juggle eight-side Rubik's cubes while trying to solve them at the same time. And every time I drop one, God kills a billion kittens" (Rajaniemi 2012, 8). The third book "focus[es] on how game-playing allows us to adopt radically different selves... [in a] game of consequences" (Lea 2010). This use of games is also evident within the narrative, where the technological extension of collective consciousness means that "you can do fun things with entanglement. *Games* become strange" (Rajaniemi 2010, 82). The 'fun things', where 'quantum weirdness' begins to interfere with conventional and expected patterns of thought, are how Rajaniemi uses games to full utopic effect. John DeNardo describes how "games...play a pivotal underpinning to many of the novel concepts, though to be more accurate, it's their ultimate extrapolated evolution that is part of the book's main themes" (2011), and this conceptual fractal extrapolation is seen within the ideas the book confronts, the games in which it presents them and the construction of the novels themselves. In this mode of working it becomes inevitable that the "plot is at times nefariously multifarious...a great puzzle box of a book" (Alexander 2012), and Rajaniemi himself has said that "if you want to write about ideas, one nice thing to have is a paradox or contradiction" (in Flett 2012). The playing out of contradictions is a future beyond our limit, positing a utopian mode of consciousness that can think beyond our current situation. This creates a posthuman view of the concept of a novel itself, with the requirement for a utopian leap beyond the effects with causality occurring afterwards, a parallax gesture upon the medium of writing in the digital age.

Rajaniemi has disseminated fragments of text from *The Causal Angel* online via Twitter before its release, cementing the series as a project that makes narrative and critical use of fractals in our relation to technology. Displaying the concern with the future of the book evident in his work on Neurofiction, this feeds into a broader trend on Twitter, and the digital medium more generally, that is expanding the notion of literature. Inspired by flash fiction³⁴ such as the six-word novel "For sale: baby shoes, never worn" attributed to Ernest Hemingway, twitter has formed a mediator for short poetry (particularly Haikus) and a semantic extreme of the term 'short story', such as @VeryShortStory who crowdsources creativity in an open call for nouns (Hill 2014). More overtly digital forms, commenting on the medium itself, include @tejucole's *Hafiz* (2014) consisted of 35 tweets, retweeted from texts he asked friends to post. He said of the event: "I wrote a story, and we told it. Great thanks to

³⁴ Fiction of extreme brevity.

my generous and self-effacing collaborators” (Cole [@tejucole] 9 January 2014). This tale of the digitally (and subjectively) mediated responses to a man suffering a heart attack on the pavement returns the critical view of the technology in literature to a critical view of literature by technology. Such works “are forged from connectivity. They don’t, however, necessarily involve narrative in a conventional sense” (Armitstead 2014). This raises a problem of narrative in Twitter beyond the event of the work, whereby archived tweets must be read in reverse order (Baddeley 2012).

The process of time moving backwards displays the inversion of Existence and Meaning in the digital realm applied to the curvature of space-time. While earlier artistic interventions such as Barbara Rauch and Dew Harrison’s *PHYSICAL_CHAT* (2002) established parallel oneiric narratives scrolling downwards through time as a collective consciousness, this is now a common mode of reading socio-cultural space-time in the reverse-chronology of social media feeds (in, for example, Facebook and Twitter). This relativistic extrapolation of narrative, disrupting the flow of causality, references what Deleuze and Guattari identify in “Einstein and his deterritorialization of the representation of the universe” (1986, 24). The criticism of present technological culture is extended beyond SF itself, echoing the deterritorialisation of the foundations of physics in hard SF with a deterritorialisation of the technological mediation of the work. The content of the narrative becomes less important than the mode in which it is expressed, inserting a minor culture within the major language of current technology, a deterritorialisation of narrative in which “fiction takes flight on Twitter” (Armitstead 2014). This draws out the need to reconceive our modes of literature for this new technology, designed for live-blogging and condensed fragments of meaning.

This fragmentary narrative is seen throughout Rajaniemi’s work, where the complexity and displacement of explanations construct a causal loop of understanding. Just as the structure of the book requires it to have already been read, so do the concepts involved require a cyborg approach to rethinking subjectivity. This truth to the criticisms that the characters remain at an unrelatable distance is necessary for the SF utopian gesture, the desire for the impossible subject. However, while in his theoretical text “Jameson says little here about how to otherwise imagine the future” (Hamner 2008, 33), Rajaniemi’s construction of a purposefully impossible (to our contemporary minds) set of characters, technologies and societies is able to posit an array of different possibilities for posthuman society, each filled with fragments of desire, hope and despair and staged within the framework of games. Examples include: “you could introduce a narrative element to it [death]...every time you die you advance the storyline a little bit” (Rajaniemi 2014a, 71) or “I watch zoku children play global thermonuclear war” (Rajaniemi 2014a, 47). The terrifying

implications of these posthuman minds displays a celestial misuse of what Deleuze would describe as the “ideal game” (Deleuze 2004b, 71), played out in thought and resulting in art, rewriting its own rules with each move.

This tension between ideas and their execution as games, injecting expressions of sense and nonsense, can be seen as an important issue in Rajaniemi’s scientific research. His interest in the role of games in tackling quantum problems extends to their use in educating the public about issues of quantum mechanics, staging concepts such as “quantum creativity”, a “collective of brains” or the “quantum hackability of games” (Rajaniemi in McEndoo 2013) in the form of scientifically rigorous games in order to explore and elaborate the impact of quantum theories on consciousness and social reality. Rajaniemi titles this social project, presented at the Games for Quantum Research Workshop 2013, ‘Just Add Quantum’, a notion that echoes fractally across his work. With all the implications of our interaction with quantum reality – social, material and cognitive ‘weirdness’ – his phrase can be seen to implore contemporary subjects to look radically beyond their current conceptions of reality, aligning their perspective and consciousness with that of a posthuman, to critically view the follies of humanity and engage thoroughly in the creative processes of instigating change in our current reality.

5.5 INFINITE REGRESS?

It is necessary to consider the nature of these processes of ‘futuring’ our perspective on technology and consciousness in relation to the ultimate progress of subjective reality and the effects of the present in defining such a future. If consciousness constructs itself simultaneously with the construction of the worlds it inhabits, the proliferation of theories proposing a calamitous end to the ultimate fate of the universe must be confronted if the subject is to place itself truly beyond the limitations of the current scope of human consciousness and into a posthuman assemblage of the cyborg. At first glance, this process seems inevitable, that we will all ‘burn out’ or ‘run out of steam’ over time, an unavoidable boundary on our conception of reality. As we have seen, this becomes a particular issue within the psychology of the immortal posthuman being trapped for eternity with the inexorable march of deterioration and madness. Indeed, the second law of thermodynamics asserts the eventual dominion of entropy over all things. Overcoming this ‘law’ is the ultimate dilemma of the existence of the physical universe, defined in Isaac Asimov’s ‘last question of humanity’:

“can this chaos not be reversed into the Universe once more?” (1956, 15). However, is a response to entropy possible beyond the fiction of a utopic parallax?

While the reversal of entropy *as such* may still exist only in the realms of fictional A.I. in the hyperspace beyond the ‘heat death’ of the universe, the disruption of everyday causality is an important conceptual step towards undermining the second law of thermodynamics. The shift in consciousness of the nature of computing in time and energy aligns with alternative methods of viewing the role of forces in constructing order within both quantum and subjective realities. The quantum universe creates order out of chaos, just as the Deleuzian universe is “chaotic as well as probabilistic, where probabilistic means that the path of individual particles cannot be predicted, but their movement in aggregates can be predicted, and with a relatively high degree of probability” (Olkowski 2011, 121). This chaotic-probabilistic nature of causality and measurement moves beyond Heisenberg’s uncertainty principle, as does the reversibility of collapse, suggesting an immanent reality with an emergent future. Entropy presupposes a closed system, but the utopic leap of the emergent nature of the universe as it appears to consciousness enables a step beyond any such subjective ‘heat death’ if loss is reversible. Through the utopic leap of reimagining the conditions of the current situation, perhaps the Real can also be reimagined and reversed in its role of underpinning causality in its relation to the Virtual of cognition.

If the entropic causality of heat death can thus be overcome, or an energetic function inserted before it could occur, the question becomes: can the universe cope with continued expansion? Indeed, this question occupies a close position to the problem of posthumanism: can the ‘human’ subject cope with the continued expansion of consciousness? The risk of unbridled expansion without the utopic leap necessary to re-posit the social conditions for such rapid change is the doom of humanity in its own excesses of technology. The psychological capability of the subject to reimagine itself carries with it the potential of an apocalyptic collapse. This could lead to a final singularity³⁵ that could cement our doom amidst the battle between entropy and technological advance. One such singularity is the ‘Big Rip’, in which all matter, from stars to atoms, is ripped apart by phantom energy, tearing apart the universe as gravity cannot keep up with expansion. In such a scenario, all structure becomes gravitationally unbound and “brings our brief epoch of cosmic structure to a close” (Caldwell *et al.* 2003) as the mass in the universe is not enough to hold itself together. If, however, the gravitational force in the universe remains higher than expansion (if the dark

³⁵ A singularity would necessarily be not only technological but psychological, social, political and ontological, with implications for the very definition of humanity and its relation to the universe.

energy causing expansion reverses), then before the universe reaches heat death a massive contraction will occur, drawing all matter into the singularity of a unified black hole. This would create a 'Big Crunch', in opposition to the 'Big Bang', as all matter collapses into itself, perhaps warning us of the potential collapse into the void of a consciousness that too greatly expands itself.

In this singularity the fundamental laws of physics, at both classical and quantum scales, would be drastically changed as the perceived constants (of, for example, the speed of light) become flexible under such extreme conditions. The extension to this 'Big Crunch' is that the unified singularity would lead to another expansion in a new 'Big Bang', an example of "cyclic cosmologies, which display phases of expansion and contraction" (Novello and Bergliaffa 2008, 130), each destruction bypassing the impasse of the universal singularity into a new creation. Drawing on string theory, this "sequence of big bang/big crunch universes attached to each other at the singularities" (Elitzur *et al.* 2002, 27) enables a positing of entire universes as vacuum fluctuations between singularities, 'virtual particles' of eventual Existence. Here we see Deleuzian repetition staged at the level of the entire universe. In this state even physical reality is a Virtual-Existence, drawing together the functioning of physical and digital worlds. We cannot see beyond our own Virtual universe, other than traces in the CMB, with each singularity unleashing a moment of the Real in the repetition of causality. Deleuze writes that the singularity of repetition "puts law into question, it denounces its nominal or general character in favour of a more profound and more artistic reality" (Deleuze 2004a, 3), and it is here that the causal Real of the event of Existence opens up possibility. Žižek insists that an event "exists only for those who recognise themselves in it. There can be no Event for a non-engaged objective observer" (2011, xiv). This draws the subjective Real into the causality of the cyclical universe, whereby constant (re)creation comes to define the Virtual functioning of the universe (or subjective reality) as a whole. Amidst the doom of reality to collapse in upon itself, as with the potential for humanity to spiral into the cataclysm of rampant technological progress, lies a potentiality for the human subject to recreate its own conditions and thereby pass beyond the singularity into a posthuman consciousness of a new reality.

5.6 CONCLUSION

In conclusion, this chapter shows that the impossible view of the cyborg subject is a self-conscious placing of its own perspective beyond the borders of current subjective reality, in a

utopic leap from which to view itself in the critical light of posthuman consciousness. By embracing the advancement of technology alongside a reimagining of the nature of the subject, new methods of constructing reality within the functioning of consciousness may emerge. This is fundamentally a creative endeavour, necessitating an act that releases an expression of sense, the underlying Real of the subject, within the utopic extension of the Virtual construction of consciousness. This must act not only upon the particulars of the subject's current situation, but upon the framework within which the parallax subject presupposes its own conditions. Žižek insists that, "before we intervene in reality by means of a *particular* act, we must accomplish the *purely formal* act of converting reality into something which is objectively given into reality as 'effectivity', as something produced, 'posited' by the subject" (2008b, 247). This formal event is a conscious creative act upon consciousness, with the posthuman creative event positing an alternative mode of consciousness in apprehending reality. This is demonstrated in the staging of fictional worlds in SF constructing evolving and alternative relations of consciousness: to technology in the development of the cyberpunk canon; to the scientific principles of reality as a whole in hard SF; to the formation of posthuman subjects by Rajaniemi. In Žižek's gesture of parallax and Jameson's fictional utopia, "an act proper...retroactively creates its conditions" (Žižek 2011, 33), generating an effective, and indeed affective, retro-causality over the manner in which the current social situation is constructed and maintained, and also over the potential future(s) of such situations. Within the Virtual is always a stain of the Real, and it is the 'impossible' task of the creative subject to encounter this void of subjectivity within its technologically enhanced perspective, in order that a critique of consciousness and society might instigate genuine evolutionary change. The posthuman is thus the creative subject imagining itself beyond a resolution of the cyborg assemblage of consciousness, making contact with the Real that underpins the multiverse of particular realities at the singularity of subjective reality.

CONCLUSION

This thesis presented an investigation into the construction of the cyborg subject as a set of relations between the functions of consciousness. Starting with the ontological dilemma of the contemporary subject caught between physical and digital worlds, the answer to the first research question – what constitutes the gap between physical and digital worlds within consciousness – rests within the subject itself. The thesis established a parallax between physical and digital realities, placing the gap of the subject as the inaccessible point of reference from which an epistemological position can create consciousness of both worlds. It is within consciousness that physical and digital worlds are created in the ontological gesture of parallax whereby ontological shifts are created by a shift in the mode of thinking. The inaccessibility of the perspectival position of this parallax, as the gap between physical and digital worlds, raises the issue of the void of subjectivity, and the suggestion of a subject not decentred but desubstantialised. The nature of this void was questioned and a critical model suggested for analysing digital culture in a way that might establish a method of confronting the inaccessible void. To undertake this investigation, a number of functions of consciousness were delineated to enable the interrogation of the relations within the subject that constitute the formation of physical and digital worlds as different spaces and modes of thinking.

The second research question – how does the functioning of consciousness construct the parallax subject between physical and digital worlds – was developed through the analytical framework of four functions of consciousness: Existence (the being-function of consciousness), Meaning (the communication-function between consciousnesses), Virtual (the function-function of consciousness itself) and Real (the void-function whereby the inaccessible core of the subject may be confronted within consciousness). The relative alignments of these functions construct physical and digital realities within consciousness: Real-Existence and Virtual-Meaning in the physical world; Real-Meaning and Virtual-Existence in the digital. The terms for the functions were expanded and redefined across Žižekian, Deleuzian and quantum physical concepts to allow for an integration of these three core theories used throughout the thesis. Specific relations between the terms were assessed through an analysis of various digital technologies and cultures to develop a theoretical understanding of the self-posed construction of consciousness: an assemblage formed between physical and digital worlds around the void of subjectivity. This formation of the subject is a pure Virtuality; it exists only within the self-perpetuating functioning of

consciousness outside of materiality, in an epistemic causality at the quantum level of the appearance of the universe. For this reason, the core relation of the subject to be considered in its formation and the formation of reality was between Virtual, the functioning as such of consciousness, and Real, the objectification of the void as the 'reality' of the subject.

This critical framework was established in order to answer the final research question – how the cyborg subject of digital-physical parallax can creatively and critically intervene in its own functioning. This enabled an analysis of the digital in-itself within consciousness, expressed through but not dependent on specific manifestations in culture. For this reason, film, photography and performance were used sparingly throughout the thesis, as these media have been discussed elsewhere in terms of the impact of digital technology on pre-existing physical paradigms, viewing the digital through lenses of embodied or cinematic materialism. The aim of this thesis was to move beyond the materialist hegemonies in current scholarship, to analyse contemporary subjectivity as cyborg and in which physical and digital are equal, yet irresolvable, modes of consciousness. Through such analysis, the research uncovered methods of critically confronting the cyborg subject by creating a space in which to view the parallax position from which the Virtuality of consciousness thinks. The inaccessibility of the parallax void of subjectivity necessitates an interrogation of the role of fantasy, beyond its status as the imaginary, as the structures of desire within consciousness. This is the fantasy both *in* and *of* digital technology, the traversal of which allows a confrontation with the self-mediation of consciousness. Analyses of specific creative practices in digital culture were undertaken in order to allow a critical antagonism within the subject, through which self-mediation and the relation of the subject to its own position of parallax can establish a new mode of philosophy concerning the digital in relation to the subjective reality of a cyborg consciousness.

To answer the core research questions, five subsidiary questions were posed to focus the discussion guiding the five chapters. The first stage in rethinking our relation to digital technology was to define the ontological difference to consciousness between physical and digital worlds that instigates the appearance of the gap within cyborg reality. This formed the first chapter of the thesis in a discussion of the inversion of Existence and Meaning, whereby the physical mode of reality presupposes the appearance of an external world (precedence of Existence) and the digital mode presupposes a communicable truth of code (precedence of Meaning). The alignment of these functions with the Real, as presupposed, followed by Virtuality, in the completion of a given world, was postulated as the process by which consciousness mediates itself through engagement with either form of reality. This conception of the formation of consciousness as part of a set of realities underpins an

understanding of the appearance of ontological difference between physical and digital worlds while placing this difference within the functioning of consciousness, exemplifying the ontological impact of the epistemological shift in the gesture of parallax. In Deleuzian terms this is desire as a machinic process, and the constant disruptive power of the war machine in a nomadology of subjectivity applied here to the shifting subject across physical and digital territories that are themselves ever shifting within consciousness. In quantum physical terms, the formation of these two realities appears as parallel universes, as well as the shift between classical and quantum levels of reality that inhibits a critical viewing of the mediation of observation for the spectator within reality. These findings provided analytical tools for assessing creative interventions in digital culture, using Benayoun's art practice to generate a conception of digital technology as a cognitive/psychological construct forming a shifting collective cyborg subjectivity constantly rewriting the landscape of the digital. The chapter showed that to critique the mediation of consciousness by digital technology in art and culture necessitates a critique of the mediation of consciousness by itself, if the functioning of the subjective assemblage is to be analysed and the void of subjectivity confronted.

The second chapter interrogated further the emergence of the Virtual as the functioning of consciousness, assessing the formation of the subject as an assemblage. The relation between Virtual and Real becomes instantly clear as the surface of consciousness conceals the void of the parallax position. The Virtual process by which consciousness emerges from the void is a necessary consideration for the construction of the subject. However, it is through the Virtuality of consciousness that the void becomes inaccessible and the Real appears as the objectification of the void as lost. The formation of the surface was theorised as a Deleuzian Body without Organs, a seamless surface which itself resists mapping. This necessitated new cartographies for the shifting territories of the subject that were demonstrated in Chapter 1, derived from and informing mappings of the ephemeral spaces of the digital. The constantly fleeing landscapes of this surface proved that the Virtual itself takes on the role of lost object, bound to the Real that it attempts to conceal as the BwO forms itself as always-already lost. In order to comprehend both functions, the chapter suggested that a space of the Real must be opened within the surface of consciousness, through which the process of Virtuality and the nature of Reality can be critically confronted. This was expanded through the problematic relations between fundamental forces and matter in quantum physics, most notably the inaccessibility of vacuum states and the many unknowable particles forming much of the universe. These objects that are perceivable only through the traces they leave upon visible particles function as lost objects, objectifications of the void, and the steps theoretical physics takes to comprehend these incomprehensible

forces was found to be instructive in conceiving the inaccessibility of the void of our own consciousness. This concept was applied to an analysis of digital art works that negotiate digital processes defying epistemological reckoning, the inaccessibility of code made manifest within gallery spaces. The art works of Dombis in particular formed a study of the direct relation between code, visual expression and subjectivity through digital technology. The findings of this analysis led towards a new conception of the contemporary subject as a BwOwB: desubstantialised rather than decentered; constantly removing itself as a lost object in its Virtual formation around the void of subjective parallax; for which a consideration of the psychological and cognitive inaccessibility of its nature is integral to renegotiating our understanding of it.

The third chapter returned an interpretation of the Real to the relation between physical and digital worlds, in particular the problematic position of nostalgia in which the contemporary subject holds physical 'reality'. Issues of embodiment were challenged in both the digital and physical realms, towards a suggestion of disembodiment as a necessary viewpoint for confronting the engagement of consciousness across worlds. Representative bodies constructed within digital spaces were revealed as lost objects, embodiments of the Real of the subject and the structure of desiring a body that drives us to create substitutes with which to engage with a physically inaccessible cognitive space. Through this problematic construction of the digital body a perspective on our physical bodies provided an instructive counterpoint. The body in general was thus proven to be a lost object bound into our conception of what is Real to the subject, leading to an interrogation of what remains within consciousness between physical and digital worlds. Deleuze's conception of difference and repetition established the illusion of identity in embodiment, placing the repetition of the Real within consciousness as the true substance of the subject rather than the Virtualising differentiations that define and create the lost characteristics the subject hopelessly desires to regain. Deleuze and Guattari's faciality, a relation between white wall and black hole, was found to provide further theorisation to the Virtual-Real relation of surface and void in constructing digital faces as shifting illusory masks. The inherent antagonism within identity was explored through the wave-particle duality of quantum physics, along with the notion of superposition and the role of the engaged spectator. Avatar-mediated spaces provided a setting for this analysis, in particular Second Life as a space for creatively engaging with digital embodiment as objectification, expression and interface. The impossibility of a complete avatar and its perpetual antagonism with the physical body of the user was shown to require hypertextual methods of viewing our engagement with any given space, and the chapter suggested a move away from embodied thought towards a disembodied view of the

contemporary subject as it moves freely between physical and digital realities as modes of consciousness. Finally, the chapter proved the integral role of Virtuality and desire in the structures that enable embodied thought, emphasising the need to look beneath these structures of consciousness to approach the core of the cyborg subject.

This structure between the Virtual and the Real was the topic of the fourth chapter, which moved beyond Žižek's use of cyberspace to stage and traverse the fantasies of the physical subject (in Wright and Wright 1999) to focus on the fantasy of the digital itself. This was undertaken through the disruption of human mortality in relation to digital technology, with an uploaded consciousness able to be copied and restored indefinitely. The alignment of the Real as death-drive and the Virtual as the desire for life in functioning consciousness showed a confrontation with immortality as the potential horror of the digital within the structures of fantasy surrounding the humanity of the cyborg subject. The relation of desire to death was interrogated through the Deleuzian notion of becoming, extended through becoming-animal towards a becoming-death in the digital in general, and computer games in particular, whereby a series of lives sustain immortality with death never achievable. The impact of this in relation to the parallax of the cyborg was shown through consideration of the return to the physical world: it is the frail mortal body of the physical player that persists once the character is killed, the game lost and the computer turned off. This was furthered through an extension of parallel universes into the quantum immortal, in the problematic relation of the subject to viewing its objectified death on screen, and an exploration of the possibility of staging an immortal subject outside of physical space-time in the digital world. A study from the *Portal* series then proved instructive, in the analysis of the character GLaDOS as an immortal bio-computer hybrid turned monster. The psychological impact of transcending the physical-digital divide and achieving immortality through technology was found to reveal the necessary rupture of parallax in the subject between worlds, as human mortality becomes the lost object of desire for such a monstrous being. This fantasy of technology was drawn back into the relation between Virtual and Real in their simultaneous formation within consciousness, finding the necessary emergence of the void as the presupposed horror of existence: the monster is the emergence of subject itself. This notion that "the X beyond words is a pure effect of words" (Žižek 2011, 68) extends throughout the structure of fantasy and, as has been shown in Chapter 2, the creation of the void of subjectivity objectified as lost in the Real is a necessary effect of the emergence of the Virtuality of consciousness.

The final chapter confronted the necessity of an antagonism between Virtual and Real, using Jameson's notion of utopia in SF literature to establish the role of desire in transcending the current conception of the subject in relation to digital technology. By constructing

fictional alternative modes of subjectivity, a critical distance towards our current state of consciousness was found to emerge, traversing the fantasy of the subject while maintaining the necessary antagonism of Virtual and Real. This enabled the parallax position to be viewed as a critical renegotiation of the Virtual-Real relationship and reconception of the cyborg subject. This critical process demonstrated the need for both cognitive and cultural reorganisations of our approach to technology beyond nostalgic fetishisation, informed by a critical view of the functions of consciousness. This used an analysis of SF concerning the digital and our relation to it, even if not necessarily presented in a digital format. Deleuze's propositional logic and minor literature informed an assessment of the development of cyberpunk fiction and the changing relation of the digital as it has been integrated into our culture, suggesting the need for alternative manifestations of such relations and stated the emergence of a minor culture as the becoming-otherwise of the current digital archetypes of mass culture. Expanding this through hard SF into the relation between human mastery over technology with human mastery over the quantum universe raised the problematic psychological issues of such shifts if alternative modes of subjectivity are not developed. This analysis of SF writing was applied to the explicit confrontation of the cyborg subject as a posthuman expression of physical-digital unity in our modes of consciousness and existence in Rajaniemi's fiction. The critical power of the distance of such subjects was proven as the analysis returned to critiquing and expanding our current relations to the culture and consciousness of technology. The chapter concluded by asserting the need for a constant positing of alternative modes of subjectivity with a critical distance to our own situation. Through this, a flight from the self can enable the creative reconstruction of consciousness and draw the cyborg subject into thinking otherwise about its own internal relations, in turn providing a framework for rethinking our relations to physical and digital realities beyond the structures of parallax that define contemporary cyborg subjects.

CONTRIBUTION TO KNOWLEDGE

The research questions investigated in this thesis offer an original contribution to knowledge across three key fields. The conceptual framework developed as a method of establishing the basis for a philosophy of the digital has an impact on consciousness studies in reimagining the relation of digital ontology within consciousness and placing the subjective parallax as central to a cognitive theorisation of physical and digital realities. The analysis of texts using and concerning the digital has relevance for cultural theory, utilising the functions of

consciousness to psychoanalyse works across the varying disciplines that use digital technology, drawing out critical themes and raising theoretical issues across disciplines in the representation of the digital in contemporary culture. Finally, the application of the thesis impacts upon the use of digital technology in creative practices that seek to further understand the relations of digital and physical mediation within subjectivity, and without the nostalgic aesthetics that often places digital practice at odds with traditional physical culture. This method of inquiry has already begun alongside the theoretical text of the thesis, in the interactive game-based piece *Psycosmorrery* (Benjamin 2013) as part of an ongoing research show, and *Augmented Headspace: Digital Parallax* (Benjamin 2014) presented at the International Žižek Studies Conference on the theme 'Parallax Future(s)', paving the way for further explorations of the impact of this research project for creative practice by the author and others. The thesis proposes a new mode of conceiving the contemporary subject as a cyborg in relation to consciousness and suggests the need for a new culture of the cyborg in which its necessary antagonisms are sustained while inserting a self-critical rupture through which the further evolution and expansion of human consciousness might be creatively manipulated.

The application of Žižek's notion of parallax to the split between physical and digital worlds has not yet been undertaken, and the thesis offers an initial investigation into this method of examining digital technology within a psychoanalytical framework beyond conventional materialities that dominate current debates in the field. By placing the ontological difference of the digital within consciousness, as defined by the epistemological parallax shifts of the subject, the thesis suggests a reassessment of the relation of the individual subject to its engagement with digital technology. The conceptual framework of the functions of consciousness is itself an original contribution to knowledge, redefining the parameters of both Virtuality and Reality according to an inversion of Existence and Meaning. This schema draws out the particularities of a digital parallax and explicates the internal relations of subjectivity that form such a position.

The use of these terms across their definition by Žižek and Deleuze brings together two current expansions to our conceptions of digital technology that have thus far remained detached. While a critique of the term 'Virtual Reality' has been established (for example Murphie in Massumi 2002b, 188-214), the focus has rested on a disruption of either the Virtual from a Deleuzian perspective or the Real from a Žižekian-Lacanian perspective. This thesis, however, draws its critique from both perspectives, inserting a rupture not only in the term VR but in the relation of Virtual and Real to any objective external referent, in order to insist upon a subjective critique of the socio-cultural construction of the digital realm. The discussion of

this antagonism between the philosophies of Žižek and Deleuze is itself contributed to by the thesis, which places the critique not from one position or the other, but from an anti-materialist perspective that aligns the two theorists within discussions of subjectivity. Furthermore, the inclusion of quantum physics as a theorisation of the unseen forces defining reality goes beyond Žižek's and Deleuze's allegorical use of such developments in physics to an acknowledgement of the parallax relation of the ontological impact of the epistemic subject to its entire gamut of realities. The use of the three theories to assess the digital is a further development in the study of digital culture, establishing an original methodology for a philosophy of digital consciousness.

Throughout the analytical application of these theoretical developments, the thesis offers a number of additional contributions to knowledge in the form of a series of critiques of current modes of thinking the digital. The conception of the *engaged spectator* moves beyond the current debates surrounding interactivity, interpassivity and immersion, in searching for a term that allows an adequate confrontation with the subject's relation to participation and observation of digital technology and culture. The antagonism between Deleuze's BwO and Žižek's OwB has been expanded as the *BwOwB* that maintains the antagonistic and circular processes of loss and desire forming the contemporary subject. The phrase *objet a-vatar* provides a much needed disruption of digital embodiment if cognitive and psychological theorisations of the digital in-itself are to occur. The application of Deleuze's becoming to *becoming-death* enables a critique of the computer gaming medium as the suspension of mortality in the digital medium, sustaining the state of critical intervention in its unachievable disruption of objective-based game mechanics. Finally, the extension of Žižek's void of subjectivity into a full *desubstantialisation* of the subject enables a view of the 'nowhere of the subject' as the fundamental state of consciousness in an anti-materialist gesture of contemporary ontology. The thesis thus contributes to the extension of the term 'cyborg' in relation to the subject of the digital age, reasserting its role in expanding consciousness and enabling an embracing of the technological and cultural evolution of humanity.

FURTHER RESEARCH

This study of the cyborg subject in relation to the construction of consciousness and parallax has a number of intended applications for scholarly and practical research. The aim of the thesis is that by establishing new modes of critique for digital technology and its theorisation,

a framework has been provided with which to assess future philosophies of the digital and assist scholars in the fields of digital technology, consciousness studies and cultural theory in developing digital theory beyond the current materialist and often film-based models. The method of moving beyond Žižek, as well as the negotiation of a position between his own work and that of Deleuze, develops a cultural application of the two thinkers to issues of twenty-first century subjectivity. It is also intended that the thesis provide a theoretical consideration for digital practitioners in illuminating the forces at work within a subjective relation to digital technology, and as a method for renegotiating the differences between physical and digital cultural practices.

Certain directions of the discussion have remained beyond the scope of this text, as set out in the introduction. For example, the range of media upon which the analyses presented here has focused does not extend to issues of film, photography or performance in the digital age. It is left to further research for the theoretical position expounded in this thesis to be applied to these media. However, the framework offered provides an informative structure for the continued development of these fields. The boundaries of the thesis apply also to the philosophical position. As stated in defining the research questions, this project does not attempt a *complete* philosophy of the digital. What it seeks to provide is a *consistent* framework of the subject's position between physical and digital ontologies, through a critique of commonly perceived notions in the current culture of the digital. The development of the functions of consciousness and the parallax of the digital establishes a ground upon which further research might expand this philosophical position. The specific conditions under which the research is primarily valid are therefore the internal relations of consciousness in the context of digital technologies, formulating the cyborg outside individual embodiments in the cognitive processes at work beneath contemporary subjectivity.

This grounding provides a number of specific avenues for direct future development of the research project. Each chapter has proposed a defined theoretical exposition in relation to a given strand of digital culture, unveiling new methods of thinking our relation to digital technology that could be expanded into medium-/discipline-specific work. Issues raised, such as hyper-cartographies, the *objet a*-vatar, the big Other in computer games or the shift in cyberpunk fiction from hacking code to hacking culture, are each deserving of further investigation as a potential basis for postdoctoral research projects. This has also prepared a ground for a practical development of the research, applied directly to the creative practice of digital culture. There is a current need in scholarship and creative practice for the application of a futuring of the notion of parallax, the conception of the subject and our relation to digital technology, to which this research both contributes and raises new challenges.

To offer a concluding remark, this thesis is intended as a confrontation with the smooth functioning of the contemporary subject and a mode of rethinking our relationship towards all manner of physical and digital realities in order to create the conditions of possibility for the development of future culture of the cyborg and its technologies.

BIBLIOGRAPHY

Aceti, Lanfranco (2013) 'I Occupy' <http://www.lanfrancoaceti.com/2013/10/i-occupy/>, October 2013, accessed 7th November 2013

Aguirre, Anthony and Max Tegmark (2011) 'Born in an Infinite Universe: a Cosmological Interpretation of Quantum Mechanics' in *Physical Review D* **84**(10.5002), 16p

Albert, David Z. (1992) *Quantum Mechanics and Experience* Cambridge, MA: Harvard University Press

Alexander, Niall (2012) 'A Quantum Conundrum: *The Fractal Prince* by Hannu Rajaniemi' <http://www.tor.com/blogs/2012/09/a-quantum-conundrum-the-fractal-prince-by-hannu-rajaniemi>, 27 September 2012, accessed 24 July 2013

Amine, Patrick (2011) 'Towards an Active Perception of Things' <http://dombis.com/towards-an-active-perception/> September 2011, accessed 9 December 2013

Armitstead, Claire (2014) 'Has Twitter given birth to a new literary genre?' <http://www.theguardian.com/books/booksblog/2014/jan/10/twitter-birth-new-literary-genre> 10 January 2014, accessed 4 February 2014

Artcat (2010) 'Carlos Ginzburg: Fractalizations and Other Works' <http://calendar.artcat.com/exhibits/10757> 2010, accessed 5 December 2013

Ascott, Roy (ed.) (2000) *Art, Technology, Consciousness: mind@large* Bristol: Intellect
- Ascott, Roy 'Edge-Life: technoetic structures and moist media' 2-6

Ascott, Roy (2005) 'Syncretic Reality: art, process, and potentiality' in *DRAINMAG* **2**(2)
- (2008) 'Cybernetic, Technoetic, Syncretic: The Prospect for Art' in *Leonardo* **41**(3), 204

Ashby, William (1957) *An Introduction to Cybernetics* London: Chapman and Hall

Asimov, Isaac (1956) 'The Last Question' *Science Fiction Quarterly*, November 1956, 7-15

Au, Wagner James (2007) 'New World Newsfeed: CTO Cory Linden Leaves' <http://nwn.blogs.com/nwn/2007/12/new-world-new-3.html>, 12 December 2007, accessed 15 January 2013

Baddeley, Anna (2012) 'Twitter and literature: unlikely bedfellows?' <http://www.theguardian.com/books/2012/nov/04/twitter-fiction-festival-literature-storytelling> 4 November 2012, accessed 4 February 2014

Badiou, Alain (2005) *Being and Event* London: Continuum
- (2007) 'The Event in Deleuze' in *Parrhesia* **2**, 37-44

Baecker, Ralf (2009) 'The Conversation' http://www.rlfbckr.org/work/the_conversation 2009, accessed 20 November 2013

- (2011) 'Irrational Computing' http://www.rlfbckr.org/work/irrational_computing 2011, accessed 20 November 2013

- (2013) 'Biography' <http://www.rlfbckr.org/vita> 2013, Accessed 20 November 2013

- Ball, Philip (2008) 'Quantum all the way' in *Nature* **453**, 22-5
- Bard, Alexander and Jan Söderqvist (2012) *The Futurica Trilogy: The Netocrats; The Global Empire; The Body Machines* [kindle edition] Stockholm: Stockholm Text
- Barlow, John Perry (1996) 'A Declaration of the Independence of Cyberspace' <https://projects.eff.org/~barlow/Declaration-Final.html>, 8 February 1996, accessed 12 November 2013
- Baudrillard, Jean (1994) *Simulacra and Simulation* Ann Arbor: University of Michigan Press
- (2005) *The Intelligence of Evil or the Lucidity Pact* Oxford: Berg
- Bell, Sean (2008) 'Braid Preview (Xbox Live Arcade, PC)' www.darkzero.co.uk, 22 March 2008, accessed 28 March 2012
- Benayoun, Maurice (1991) 'The Quarxs' <http://www.benayoun.com/projet.php?id=89>, 1991, accessed 8 November 2013
- (1995) 'The Tunnel Under the Atlantic' <http://www.benayoun.com/projet.php?id=14>, December 1995, accessed 8 November 2013
- (1996) 'Diabolo ex machina' <http://www.benayoun.com/projetwords.php?id=63>, 1996, accessed 8 November 2013
- (2001) 'From Virtual to Public Space: Toward an Impure Art' <http://www.benayoun.com/projetwords.php?id=48>, 2001, accessed 8 November 2013
- (2005) 'The Mechanics of Emotions' <http://www.benayoun.com/projet.php?id=27>, 2005, accessed 8 November 2013
- (2006a) 'Concept Art' <http://www.the-dump.net/2006/10/23/concept-art-14th-October-2006>, 14 October 2006, accessed 8 November 2013
- (2006b) 'Stolen Life' <http://www.benayoun.com/projet.php?id=142>, 2006, accessed 8 November 2013
- (2008) 'Art After Technology' <http://www.benayoun.com/projetwords.php?id=114>, 2008, accessed 8 November 2013
- (2012a) 'Biography: Maurice Benayoun' <http://www.benayoun.com/bio.php?id=37> March 2012, accessed 13 January 2014
- (2012b) 'Tunnels Around the World' <http://www.benayoun.com/projet.php?id=179>, 2012, accessed 8 November 2013
- Benjamin, Garfield (2013) 'Civilisation on the Couch: Theorising Multi-levelled Psychoanalytical Arts Practice' in *SAGE Arts and Humanities in Higher Education* [online first]
- Betancourt, Michael (2010) 'Immaterial Value and Scarcity in Digital Capitalism' <http://www.ctheory.net/articles.aspx?id=652>, 10 June 2010, accessed 12 November 2013
- Bissell, Tom (2011) 'Neal Stephenson's Novel of Computer Viruses and Welsh Terrorists' http://www.nytimes.com/2011/09/25/books/review/reamde-by-neal-stephenson-book-review.html?_r=0&adxnnl=1&adxnnlx=1374671080-MLulvVGybps8Ei5ydbenPg, 23 September 2011, accessed 24 July 2013
- Blackhawk (2003) 'Le Main de l'Homme' <http://dombis.com/blackhawk/> December 2003, accessed 9 December 2013
- Blake, Victoria (ed.) (2013) *Cyberpunk: Stories of Hardware, Software, Wetware, Evolution, and Revolution* Portland: Underland Press [kindle edition]
- Doctorow, Cory 'When Sysadmins Ruled the Earth' 391-427
- Bogue, Ronald (2004) *Deleuze's Wake: Tributes and Tributaries* Albany: State University of New York Press

- Bohm, David (1952) 'A Suggested Interpretation of the Quantum Theory in Terms of "Hidden Variables" I' and 'A Suggested Interpretation of the Quantum Theory in Terms of "Hidden Variables" II' in *Physical Review* **85**, 166–179; 180-193
 - (1994) *Thought as a System* London: Routledge
 - (2002) *Wholeness and the Implicate Order* London: Routledge
- Bolognini, Maurizio (2012) 'Bio' <http://www.bolognini.org/bio.htm> 2012, accessed 4 December 2013
- Bookchin, Natalie and Alexej Shulgin (1999) 'Introduction to net.art (1994-1999)' <http://www.easylife.org/netart/catalogue.html>, March-April 1999, accessed 12 November 2013
- Bostrom, Nick (2003) 'Are you living in a computer simulation?' in *Philosophical Quarterly* **53**(211), 243-255
 - (2008) 'Letter from Utopia' in *Studies in Ethics, Law and Technology* **2**(1), 1-7
- Bostrom, Nick and Anders Sandberg (2009) 'Cognitive Enhancement: Methods, Ethics, Regulatory Challenges' in *Science and Engineering Ethics* **15**, 311-341
- Bould, Mark and China Miéville (eds.) (2009) *Red Planets: Marxism and Science Fiction* London: Pluto
 - Bould, Mark 'Introduction: Rough Guide to a Lonely Planet' 1-27
- Bowden, Sean (2010) 'Deleuze's Neo-Leibnizianism, Events and *The Logic of Sense's* 'Static Ontological Genesis'' in *Deleuze Studies* **4**(3), 301-328
- British Film Institute (2013) *BFI London Film Festival 2013 Catalogue* London: BFI
- Broeckmann, Andreas (2006) 'Software Art Aesthetics' in *Mono* **1**, 158-167
- Brooks, Michael (2013) 'Quantum Leak' *New Statesman*, 21-27 June 2013, 15
- Brouwer, Jake, Andreas Brockmann, Bart Lootsma, Arjen Mulder, and Lars Spuybroek (eds.) (1998) *The Art of the Accident* Rotterdam: NAI Publishers
- Brown, Julian. R. and Paul Charles William Davies (eds.) (1986) *The Ghost in the Atom: A Discussion of the Mysteries of Quantum Physics* Cambridge: Cambridge University Press
- Buchanan, Mark (2007) 'See me here, see me there' in *Nature* **448**, 15-18
- Buci-Glucksmann, Christine (2009) 'Time Spirals: from the immemorial to the ephemeral' http://dombis.com/wp-content/uploads/2012/11/CBG_Time-spirals.pdf 2009, accessed 6 December 2013
 - (2012) 'A New Regime of Images' <http://dombis.com/a-new-regime-of-images/> 2012, accessed 6 December 2013
- Caldwell, Robert R., Marc Kamionkowski and Nevin N. Weinberg (2007) 'Phantom Energy: Dark Energy with $w < -1$ Causes a Cosmic Doomsday' in *Physical Review Letters* **91**(7:071301) [4 pages]
- Capra, Fritjof (1992) *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism* London: Flamingo
- Carr, B. (ed.) (2007) *Universe of Multiverse?* Cambridge: Cambridge University Press
 - Tegmark, Max 'The Multiverse Hierarchy' 99-126

- Carter, Stuart (2007) 'The Jennifer Morgue' <http://www.sfsite.com/o3bjm244.htm>, 2009, accessed 25 July 2013
- Cevasco, Maria Elisa (2007) 'Archaeologies of the Future: Western Marxism Revisits Utopia' in *Situations* 2, 120-7
- Chang, Angela (2007) 'Q&A: William Gibson' <http://www.pcmag.com/article2/0,2817,2080922,00.asp>, 10 January 2007, accessed 31 July 2013
- Cheung, François (1994) *Empty and Full: the Language of Chinese Painting* Boston: Shambhala
- Chown, Marcus (2007) 'The void: Imprint of another universe?' in *New Scientist* 2531, 34-7
- Cirio, Paolo (2012) 'Street Ghosts' <http://streetghosts.net/>, 15 September 2012, accessed 12 November 2013
- Clarke, Arthur C. (2000) *Profiles of the Future: An Inquiry into the Limits of the Possible* London: Gollancz
- Cline, Ernest (2012) *Ready Player One* London: Random House
- Cole, Teju [@tejucole] (9 January 2014) "I wrote a story, and we told it. Great thanks to my generous and self-effacing collaborators" <https://twitter.com/tejucole/status/421413197623853056>
- Collins English Dictionary – CollinsDictionary.com* (2013) 'Avatar' HarperCollins Publishers, <http://www.collinsdictionary.com/dictionary/english/avatar>, accessed 5 February 2013
- Condé, Susan (2001) 'The Fractal Artist' in *Leonardo* 34(1), <http://www.leonardo.info/gallery/gallery341/conde.html> accessed 5 December 2013
- Couric, Katie (2013) 'Are Video Games Ruining Your Life?' <http://katiecouric.com/2013/05/01/daniel-petric-video-games/>, 1 May 2013, accessed 26 September 2013
- Craig, David Parker and T. Thirunamachandran (1984) *Molecular Quantum Electrodynamics: An Introduction to Radiation Molecule Interactions* London: Academic Press
- Creeber, Glen and Royston Martin (2009) *Digital Cultures: Understanding New Media* Maidenhead: Open University Press
- Cruz, M., E. Martínez-González, P. Vielva and L. Cayón (2008) 'Detection of a non-Gaussian Spot in WMAP' in *Monthly Notices of the Royal Astronomical Society* 356(1), 29-40
- Daily Mail Reporter (2003) "Of course I love you darling... Now just let me finish this game.' Could computer games spell the death of your relationship?' <http://www.dailymail.co.uk/femail/article-1329877/Of-course-I-love-darling--Now-just-let-finish-game-Could-games-spell-death-relationship.html>, 16 November 2010, accessed 26 September 2013
- Davis, Creston (ed.) (2009) *The Monstrosity of Christ: Paradox or Dialectic?* Cambridge, MA: MIT Press
- Debailleux, Henri-François (2008a) *Pascal Dombis: Géométries Irrationnelles* Vitry-Sur-Seine: Galerie Municipale de Vitry

- (2008b) 'States of the Line' <http://dombis.com/states-of-the-line-hfd/> 2008, accessed 9 December 2013

De Landa, Manuel (1997) *A Thousand Years of Nonlinear History* New York: Zone
- (2006) *A New Philosophy of Society: assemblage theory and social complexity* London: Continuum

Deleuze, Gilles (1988) *Bergsonism* New York: Zone
- (2004a) *Difference and Repetition* London: Continuum
- (2004b) *The Logic of Sense* London: Continuum
- (2006a) *Foucault* London: Continuum
- (2006b) *The Fold* London: Routledge

Deleuze, Gilles, & Félix Guattari (1986) *Kafka: Towards A Minor Literature* Minneapolis: University of Minnesota Press
- (1994) *What Is Philosophy?* London: Verso
- (2004a) *Anti-Oedipus: Capitalism and Schizophrenia* London: Continuum
- (2004b) *A Thousand Plateaus: Capitalism and Schizophrenia* London: Continuum

DeNardo, John (2011) 'REVIEW: The Quantum Thief by Hanne Rajaniemi', http://www.sfsignal.com/archives/2011/03/review_the_quantum_thief_by_hannu_rajaniemi/, 15 March 2011, accessed 24 July 2013

D'Espagnat, Bernard (2011) 'Quantum Physics and Reality' in *Foundations of Physics* **41**, 1703-1716

DeWitt, Bryce S. and Neil Graham (eds.) (1973) *The Many Worlds Interpretation of Quantum Physics* Princeton: Princeton University Press
- Everett, Hugh 'The Theory of the Universal Wave Function' 3-140

Dick, Philip K. and Lawrence Sutin (ed.) (1996) *The Shifting Realities of Philip K. Dick: Selected Literary and Philosophical Writings* New York: Vintage
- Dick, Philip K. "'How to Build a Universe that Doesn't Fall Apart Two Days Later'" (1978, 1985)' 259-280

Dinnen, Zara (2012) 'Pictures of Self-Portraits: Eva and Franco Mattes' Avatar Portraits' <http://mediacommons.futureofthebook.org/jmr/2012/05/01/pictures-self-portraits-eva-and-franco-mattes-avatar-portraits>, 1 May 2012, accessed 22 February 2013

Doctorow, Cory (2013) *Makers* London; New York: Harper Voyager

Dombis, Pascal (2004) 'Irrational Environments' <http://dombis.com/irrational-environments/> 2004, accessed 19 November 2013
- (2013) 'Crack, 2010-2013' <http://dombis.com/works/crack/> 2013, accessed 10 December 2013

Donaldson, Rodney E. (1992) 'Cybernetics & Human Knowing: one possible prolegomenon' in *Cybernetics & Human Knowing: A Journal of Second Order Cybernetics & Cyber-Semiotics* **1**(2/3)

Dubner, Stephen J. (2007) 'Philip Rosedale Answers Your Second Life Questions' http://www.freakonomics.com/2007/12/13/philip-rosedale-answers-your-second-life-questions/?hp&_r=0, 13 December 2007, accessed 31 July 2013

Earle, Nicholas (2001) 'Designing a Visual Component of Communication within 3D Avatar Virtual Worlds' PhD Thesis, University of Plymouth

Egan, Greg (2000) 'Border Guards' <http://gregegan.customer.netspace.net.au/BORDER/Complete/Border.html>, 13 April 2000,

- accessed 26 July 2013
- (2010) *Permutation City* London: Gollancz [kindle edition]
 - (2010b) *Quarantine* London: Gollancz [kindle edition]
- Eladhari, Mirjam (2010) 'Characterising Action Potential in Virtual Game Worlds Applied with the Mind Module' PhD Thesis, Teeside University
- Elitzur, Shmuel, Amit Giveon, David Kutasov and Eliezer Rabinovici (2002) 'From Big Bang to Big Crunch and Beyond' in *Journal of High Energy Physics* **2002**(6)
- Engelbart, Douglas, (1962) *Augmenting Human Intellect: A Conceptual Framework*, Summary Report AFOSR-3233
- Evens, Aden (2003) 'Concerning the Digital' in *Differences* **14**(2), 49-77
- Faucher, Kane X. (2010) 'McDeleuze: What's More Rhizomal than the Big Mac?' in *Deleuze Studies* **4**(1), 42-59
- Figger, Hartmut, Dieter Meschede and Claus Zimmerman (eds.) (2002) *Laser Physics at the Limits* Berlin: Springer
- Lambrecht, Astrid 'Observing Mechanical Dissipation in the Quantum Vacuum: An Experimental Challenge' 197-208
 - Kallenbach, Reinald, 'Lasers to Test Fundamental Physics in Space' 181-8
- Fitzpatrick, Catherine (2007) 'Cory Linden Leaves the Lab'
http://secondthoughts.typepad.com/second_thoughts/2007/12/cory-linden-lea.html, 11
 December 2007, accessed 15 January 2013
- Flett, Michael (2012) 'Hannu Rajaniemi – novelist and mathematician'
<http://www.geekchocolate.co.uk/>, 24 September 2012, accessed 11 February 2013
- Fox19 (2011) 'How video games could ruin your relationships'
<http://www.fox19.com/story/15997323/how-video-games-could-ruin-your-relationships>, 9
 November 2011, accessed 26 September 2013
- Frazer, Jonathan and Andrew R. Liddle (2011) 'Exploring a String-Like Landscape' in *Journal of Cosmology and Astroparticle Physics* **2011**(2), 26-50
- Fuller, Matthew (1997) 'Eating Disorder: The Story of a Shape'
<http://www.ctheory.net/articles.aspx?id=87>, 23 April 1997, accessed 12 November 2013
- Galloway, Alexander (2011) 'Are Some Things Unrepresentable?' in *SAGE Theory, Culture & Society* **28**(7-8), 85-102
- Gane, Nicholas and David Beer (2008) *New Media: The Key Concepts* New York: Berg
- Georgi, Howard (2007a) 'Another odd thing about unparticle physics' in *Physics Letters B* **650**(4), 275-8
- (2007b) 'Unparticle Physics' in *Physical Review Letters* **98**(22:1601), 1-4
- Gibson, William (1995a) *Neuromancer* London: Voyager
- (1995b) *Count Zero* London: Voyager
 - (1995c) *Mona Lisa Overdrive* London: Voyager
- Gigante, Denise (1998) 'Toward a Notion of Critical Self-Creation: Slavoj Žižek and the "Vortex of Madness"' in *New Literary History* **29**(1), 153-168

- Greater London Authority (2013) 'Fourth Plinth 2014/2015 Shortlist: Hans Haacke' <http://www.london.gov.uk/priorities/arts-culture/fourth-plinth/2014-2015-commissions/hans-haacke>, 2013, accessed 12 November 2013
- Grosz, Elizabeth (2008) *Chaos, Territory, Art: Deleuze and the Framing of the Earth* New York: Columbia University Press
- Guattari, Félix (2013) *Schizoanalytic Cartographies* London: Continuum
- Gunkel, David J. (2010) 'The real problem: avatars, metaphysics and online social interaction' in *New Media & Society* **12**, 127-141
- Hamner, Everett (2008) 'Review: Fredric Jameson's *Archaeologies of the Future*' in *The Hedgehog Review* Spring 2008, 31-3
- Hansen, Mark (2004) *New Philosophy for New Media* Cambridge, MA: MIT Press
- (2006) *Bodies in Code: Interfaces with digital media* New York; Abingdon: Routledge
- Haraway, Donna (1985) 'Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s' in *Socialist Review* **80**, 65-108
- (1991) *Simians, Cyborgs and Women: The Reinvention of Nature* New York: Routledge
- Hawking, Stephen (1975) 'Particle Creation by Black Holes' in *Communications in Mathematical Physics* **43**(3), 199-220
- (1988) *A Brief History of Time: From the Big Bang to Black Holes* New York: Bantam Dell
- Hayles, N.Katherine (1999) *How we Became Posthuman* Chicago: University of Chicago Press
- (2005) *My Mother Was a Computer: Digital Subjects and Literary Texts* Chicago: University of Chicago Press
- (2010) 'How we Became Posthuman: Ten Years On An Interview with N. Katherine Hayles' in *Paragraph* **33**(3), 318-330
- (2012) *How We Think: Digital Media and Contemporary Technogenesis* Chicago: University of Chicago Press
- Heim, Michael (1993) *The Metaphysics of Virtual Reality* Oxford: Oxford University Press
- Heisenberg, Werner (1949) *The Physical Principles of the Quantum Theory* New York: Dover
- (2000) *Physics and Philosophy: The Revolution in Modern Science* London: Penguin
- Hetrick, Jay (2012) 'What is Nomad Art? A Benjaminian Reading of Deleuze's Riegl' in *Deleuze Studies* **6**(1), 27-41
- Hertz-Ohmes, Peter (2010) 'Sense, Being and the Revelatory Event: Deleuze and Metamorphosis' in *Deleuze Studies* **4**(1), 83-91
- Heymer, Kay (2012) 'Pascal Dombis' Eurasia' <http://dombis.com/eurasia-by-kay-heymer/> 2012, accessed 10 December 2013
- Hill, David (2011) 'The Ethical Dimensions of a New Media Age: A Study in Contemporary Responsibility' PhD Thesis, University of York
- Hill, Sean (2014) '@VeryShortStory' <http://www.seanhill.com/veryshortstory> 2014, accessed 13 February 2014
- Holojacob (2013) 'The Quantum Thief by Hannu Rajaniemi – Book Review' <http://holowriting.wordpress.com/2013/03/06/the-quantum-thief-by-hannu-rajaniemi-review/>, 6 March 2013, accessed 24 July 2013

- Ilhde, Don (2002) *Bodies in Technology* Minneapolis: University of Minnesota Press
 - (2012) 'Can Continental Philosophy Deal with the New Technologies?' in *Journal of Speculative Philosophy* 26(2), 321-332
- Jameson, Fredric (2002) *The Political Unconscious: Narrative as a Socially Symbolic Act* London: Routledge
 - (2003a) 'Future City' in *New Left Review* 21, 65-79
 - (2003b) 'The End of Temporality' in *Critical Inquiry* 29(4), 695-718
 - (2007) *Archaeologies of the Future: The Desire Called Utopia and Other Science Fictions* London: Verso
- Jorgensen, Darren (2007) 'Anti-Utopianism and Fredric Jameson's *Archaeologies of the Future*' in *COLLOQUY text theory critique* 14, 45-57
- Jung, Carl Gustav (1968) *The Archetypes and the Collective Unconscious* Princeton: Princeton University Press
 - (2001) *Modern Man in Search of a Soul* London: Routledge
- Karatani, Kojin (2003) *Transcritique: On Kant and Marx* Cambridge, MA: MIT Press
- Kazan, Casey (2010) 'The Eridanus Void: Does a MegaMassive Black Hole One-Billion Light Years Across Exist?' http://www.dailygalaxy.com/my_weblog/2010/08/the-eridanus-void-does-a-megamassive-black-hole-onebillion-light-years-across-exist-a-galaxy-most-po.html 5 August 2010, accessed 25 November 2013
- Kearnes, Matthew (2006) 'Chaos and Control: Nanotechnology and the Politics of Emergence' in *Paragraph* 29(2), 57-80
- Klotz, Steven (2009) 'Review: Quarantine by Greg Egan' <http://mentatjack.com/2009/08/12/review-quarantine-by-greg-egan/>, 12 August 2009, accessed 25 July 2013
- Knill, Emmanuel (2010) 'Quantum Computing' in *Nature* 463(28), 441-3
- Koolhaas, Rem (2002) 'Junkspace' in *October* 100, 175-190
- Kozel, Susan (2007) *Closer: Performance, Technologies, Phenomenology* Cambridge, MA: MIT Press
- Kügler, Peter (2011) 'Sense, Category, Questions: Reading Deleuze with Ryle' in *Deleuze Studies* 5(3), 324-39
- Lacan, Jacques (1977) *The Four Fundamental Concepts of Psycho-Analysis* London: The Hogarth Press
 - (1988) *The Seminars of Jacques Lacan Book II: The Ego in Freud's Theory and in the Techniques of Psychoanalysis 1954-1955* Cambridge: Cambridge University Press
 - (2001) *Écrits: A Selection* London: Routledge
- Lambert, Gregg (2008) *Who's Afraid of Deleuze and Guattari?* London: Continuum
- Land, Chris (2005) 'Technology, Text, Subject: 'After' the Human' in *Journal of Critical Postmodern Organization Science* 3(4), 23-35
- Lea, Richard (2010) 'Hannu Rajaniemi: the science of fiction' <http://www.theguardian.com/books/2010/nov/09/hannu-rajaniemi-quantum-thief>, 9 November 2010, accessed 2 August 2013

- Lefebvre, Henri (2004) *Rhythmanalysis* London: Continuum
- Lexus (2013) 'Art is Motion: The Project' <http://www.youtube.com/watch?v=e8cqJptwNVI>, 22 October 2013, accessed 12 November 2013
- Licklider, Joseph, (1960) 'Man-Computer Symbiosis' in *IRE Transactions on Human Factors in Electronics* **HFE-1**, 4-11
- Lilley, Ernest (2006) 'The Jennifer Morgue by Charles Stross' <http://sfrevu.com/php/Review-id.php?id=4885>, November 2006, accessed 25 July 2013
- (2007) 'Is Charles Stross the 21st Century's Ian Fleming?: Charles Stross Interview' <http://sfrevu.com/php/Review-id.php?id=5071>, February 2007, accessed 25 July 2013
- Linde, Andrei (1990) *Particle Physics and Inflationary Cosmology* Chur: Harwood
- Linden Labs (2014) 'Vampire' <http://secondlife.com/destinations/roleplay/vampire>, 2013, accessed 24 January 2014
- Lister, Martin, Jon Dovey, Seth Giddings, Iain Grant and Kieran Kelly (2003) *New Media: A Critical Introduction* London: Routledge
- Lockwood, Michael (1996) 'Many Minds' Interpretations of Quantum Mechanics' in *British Journal for the Philosophy of Science* **47**(2), 159-188
- Lovecraft, H.P., (2011) *The Complete Works of H.P. Lovecraft* Amazon Media [CthulhuChick.com] – public domain [kindle edition]
- Lovecraft, H.P. 'The Nameless City (1921)' loc 2265-2478
- Lovecraft, H.P. 'The Outsider (1921)' loc 2721-2829
- Luo, Mingxing and Guohuai Zhu (2008) 'Some Phenomenologies of Unparticle Physics' in *Physics Letters B* **659**(1-2), 341-344
- Manovich, Lev (2001) *The Language of New Media* Cambridge, MA: MIT Press
- Massumi, Brian (2002a) *Parables for the Virtual: Movement, Affect, Sensation* Durham, NC: Duke University Press
- Massumi, Brian (ed.) (2002b) *A Shock to Thought: Expression after Deleuze and Guattari* London: Routledge
- Murphie, Andrew 'Putting the virtual back into VR' 188-214
- Mattes, Franco (2007) 'Nothing is real, everything is possible' http://0100101110101101.org/press/2007-07_Nothing_is_real.html, accessed 22 February 2013
- McEndoo, Suzanne (2013) 'Hannu Rajaniemi – Just Add Quantum: Game Design Hacks for Quantum Citizen Science' <http://www.youtube.com/watch?v=Q3fZp2qwQTW&feature=share&list=PLMez7lrSncXall3Fre nbnaAdj6cMY8dtg>, 2 April 2013, accessed 2 August 2013
- McLuhan, Marshall (2001) *Understanding Media* London: Routledge
- Merleau-Ponty, Maurice (2002) *Phenomenology of Perception* London: Routledge
- Merriam Webster Dictionary – Merriam-Webster.com* (2014) 'Suprarational' Merriam Webster, <http://www.merriam-webster.com/dictionary/suprarational>, accessed 22 January 2014
- Miah, Andy (2008) 'Letter to Utopia' in *Studies in Ethics, Law and Technology* **2**(1:7), [6 pages]

- Mignonneau, Laurent and Christa Sommerer (2003) 'Mobile Feelings' <http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html> 2003, accessed 11 July 2014
- (2005) 'Nano-Scape: Experiencing Aspects of Nanotechnology through a Magnetic Force-Feedback Interface' in *ACM SIGCHI International Conference on Advances in Computer Entertainment Technology* Polytechnic University of Valencia, 15-17 June 2005, 200-203
 - (2012) 'Escape' <http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html> 2012, accessed 20 January 2014
- Mignonneau, Laurent Michale Shamiyeh and Christa Sommerer (2008) 'Solar Display' <http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html> 2008, accessed 10 December 2013
- Miller, John (2011) 'Distributed Virtual Environment Scalability and Security' PhD Thesis, University of Cambridge
- Milner, Andrew (2009) 'Archaeologies of the Future: Jameson's Utopia or Orwell's Dystopia?' in *Historical Materialism* **17**, 101-119
- Moravec, Hans (1988) *Mind Children: The Future of Robot and Human Intelligence* Cambridge, MA: Harvard University Press
- Moser, Mary Anne (ed.) with Douglas Macleod (1996) *Immersed in Technology: art and virtual environments* Cambridge, MA: MIT Press
- Hayles, N. Katherine, 'Embodied Virtuality: or how to put bodies back into the picture' 1-28
 - Ronell, Avital, 'A Disappearance of Community' 119-128
 - Tenhaaf, Nell, 'Mysteries of the Bioapparatus' 51-72
- Munster, Anna (2006) *Materializing New Media: Embodiment in Information Aesthetics* Lebanon, NH: University Press of New England
- Museum of Modern Art (2011) 'Talk to Me: Augmented Reality Flash Mob' <http://www.moma.org/interactives/exhibitions/2011/talktome/objects/146407/>, 2011, accessed 12 November 2013
- Naumova, Kisa (2009) 'Kisa Naumova: Artist Statement' http://wiki.secondlife.com/wiki/User:Kisa_Naumova, 3 September 2009, accessed 21 January 2013
- Nechvatal, Joseph (2005) 'The Curvaceous Computational Paintings of Pascal Dombis' <http://dombis.com/the-curvaceous-jn/> 2005, accessed 9 December 2013
- Negroponte, Nicholas (1996) *Being Digital* New York: Vintage
- Newheiser, Mark (2009) 'Michaël Samyn, Auriea Harvey: Tale of Tales - Interview' www.adventureclassicgaming.com, 7 April 2009, accessed 28 March 2012
- Nobel Foundation (1965) *Nobel Lectures, Physics 1922-1941* Amsterdam: Elsevier
- Heisenberg, Werner 'Nobel Lecture: The Development of Quantum Mechanics (1933)' 290-301
- Novello, M. and S.E. Perez Bergliaffa (2008) 'Bouncing Cosmologies' in *Physics Reports* **463**, 127-213

- Nussbaum, Rosa (2013) 'After Subjectivity. Issues of (meta-) narrative and distribution' <http://www.digicult.it/news/after-subjectivity-issues-of-meta-narrative-and-distribution/> 9 July 2013, accessed 20 November 2013
- Oh, Bryn (2010) 'The Rabbicorn story part one – The Daughter of Gears' <http://brynoh.blogspot.co.uk/2010/09/rabbicorn-story-part-one-daughter-of.html>, 15 September 2010, accessed 26 February 2013
 - (2013a) 'Imogen and the Paintings' <http://brynoh.blogspot.co.uk/2013/01/imogen-and-paintings.html>, 15 January 2013, accessed 26 February 2013
- Osborne, Peter (2010) 'Contemporary art is post-conceptual art' Public Lecture, Fondazione Antonio Ratti, Villa Sucota, Como, 9 July 2010
- O'Sullivan, Simon (2009) 'The strange temporality of the subject: Badiou and Deleuze between the finite and the infinite' in *Subjectivity* 27, 155-171
- Owen, John D. (1999) 'Quarantine by Greg Egan' <http://www.infinityplus.co.uk/nonfiction/quar.htm>, 9 October 1999, accessed 25 July 2013
- Parr, Adrian (ed.) (2010) *The Deleuze Dictionary* Edinburgh: Edinburgh University Press
 - O'Sullivan, Simon 'Fold' 107-110
- Pickering, Andrew (2010) *The Cybernetic Brain: Sketches of Another Future* Chicago: University of Chicago Press
- Pesce, Mark (1998) '3-D epiphany' <http://www.salon.com/1998/06/13/feature947640934/>, 12 June 1998, accessed 25 July 2013
- Pope, Simon and Matthew Fuller (1995) 'WARNING! This Computer has Multiple Personality Disorder' <http://bak.spc.org/iod/WARNING%21.html>, 1995, accessed 12 November 2012
- Popper, Frank (2007) *From Technological to Virtual Art* Cambridge, MA: MIT Press
- Raets, Stefan (2011) 'The Criminal is a Creative Artist: A Review of *The Quantum Thief* by Hannu Rajaniemi' <http://www.tor.com/blogs/2011/04/the-criminal-is-a-creative-artist-a-review-of-the-quantum-thief-by-hannu-rajaniemi>, 19 April 2011, accessed 24 July 2013
- Rajaniemi, Hannu (2010) *The Quantum Thief* London: Gollancz [kindle edition]
 - (2012) *The Fractal Prince* London: Gollancz [kindle edition]
 - (2014a) *The Causal Angel* London: Gollancz [kindle edition]
 - (2014b) 'On crows, roads and the future of books' in *Arcfinity* 2.1, Exit Strategies [kindle edition]
- Rajaniemi, Hannu [@hannu] (5 April 2013) "@safetyvalve All books are a bit scary in how they get inside your head. We are just more honest about it. #neurofic" <https://twitter.com/hannu/status/320169843515076609>
 - (11 June 2013) "@SussuL Sometimes present-day reality is more than sci-fi enough" <https://twitter.com/hannu/status/344556952115900417>
- Rajaniemi, Hannu and Samuel Halliday (2013) '#neurofic' <http://neurofiction.net/>, 2013, accessed 1 August 2013
- Ramirez, Francisco Gerardo Toledo (2012) 'Because I am not Here. Selected Second Life-Based Art Case Studies: Subjectivity, Autoempathy and Virtual World Aesthetics' Doctor of Arts Thesis, University of Western Ontario

- Rancière, Jacques (2007) *The Future of the Image* London: Verso
- (2008) 'Jacques Rancière and Indisciplinarity: An Interview' in *Art&Research: A Journal of Ideas, Contexts and Methods* 2(1), www.artandresearch.org.uk/v2n1/jrinterview.html accessed 15th October 2012
- (2011) *The Emancipated Spectator* London: Verso
- Riemann, Bernhard (1873) 'On the Hypotheses which lie at the Bases of Geometry' in *Nature* 8(183-184), 14-17; 36-37
- Ross, Christine (2010) 'Spatial Politics: The (non)Destinations of Augmented Reality Art (Part II)' in *Afterimage* 38(3), 16-20
- Rubin, Mark A. (2001) 'Locality in the Everett Interpretation of Heisenberg-Picture Quantum Mechanics' in *Foundations of Physics Letters* 14(4), 301-322
- Samyn, Michaël (2008) 'The Graveyard Post Mortem' www.taleoftales.com/blog, 21 May 2008, accessed 28 March 2012
- Saorsa, Jac (2011) *Narrating the Catastrophe: An Artist's Dialogue with Deleuze and Ricoeur* Bristol: Intellect
- Sartre, Jean-Paul (2003) *Being and Nothingness: An Essay on Phenomenological Ontology* London: Routledge
- (2004) *The Imaginary: A Phenomenological Psychology of the Imagination* London: Routledge
- Saunders, Simon, Jonathan Barrett, Adrian Kent, and David Wallace (eds.) (2010) *Many Worlds? Everett, Quantum Theory and Reality* Oxford: Oxford University Press
- Tegmark, Max 'Many Worlds in Context'
- Sawyer, Ron (2011) "'Loom" and "458nm" – Two Short Films by Polynoid' www.somethingmostdreadful.com, 3 June 2011, accessed 26 March 2012
- Searle, Adrian (2012) 'Yayoi Kusama: a spot of bother' <http://www.theguardian.com/artanddesign/2012/feb/07/yayoi-kusuma-tate-modern-review> 7 February 2012, accessed 20 November 2013
- Sheffield, Brandon (2010) 'GDC Europe: *Limbo*'s Carlsen on Making Players Your Worst Enemy and Your Best Friend' www.gamasutra.com/view/news/120739/, 16 August 2010, accessed 30 March 2012
- Sholette, Gregory (2011) *Dark Matter: Art and Politics in the Age of Enterprise Culture* London: Pluto
- Shortbread, Angrybeth (2006a) *Avatar DNA: notecard* <http://maps.secondlife.com/secondlife/The%20Port/28/87/26>, accessed 21 February 2013
- (2006b) 'You Demand Too Much of Me...': notecard <http://maps.secondlife.com/secondlife/The%20Port/14/75/34>, accessed 21 February 2013
- Shostakovich, Dividni (2010) 'Bryn Oh's Identity Discovered!' <http://dividni.blogspot.co.uk/2010/08/bryn-ohs-identity-discovered.html>, 11 August 2010, accessed 21 February 2013
- Siapera, Eugenia (2012) *Understanding New Media* London: SAGE
- Smith, Daniel W. (2004) 'The Inverse Side of the Structure: Žižek on Deleuze on Lacan' in *Criticism* 46(4), 635-650
- (2007) 'The Conditions of the new' in *Deleuze Studies* 1(1), 1-21

- (2009) 'Deleuze's Concept of the Virtual and the Critique of the Possible' in *Journal of Philosophy: A Cross-Disciplinary Inquiry* 4(9), 34-43
- Smith, Marquard (ed.) (2005) *Stelarc: the monograph* Cambridge, MA: MIT Press
 - Kroker, Arthur and Marilouise Kroker 'We are all Stelarcs Now' 63-85
 - Massumi, Brian 'The Evolutionary Alchemy of Reason' 125-90
- Smith, Roberta (2007) 'Art in Review; Eva and Franco Mattes' *The New York Times* 9 March 2007
- Smythies, John (2003) 'Space, Time and Consciousness' in *Journal of Consciousness Studies* 10(3), 45-56
- Solimano, Sandra (ed.) (2005) *Maurizio Bolignini: Programmed Machines, 1990-2005* Genova: Neos
 - Madesani, Angela 'The Nomadic Sign' 56-7
- Steane, Andrew (1998) 'Quantum Computing' in *Reports on Progress in Physics* 61(2), 117-173
- Stephenson, Neal (1992) *Snow Crash* London: Penguin
 - (1996) *The Diamond Age* London: Penguin
 - (2001) 'Communication Prosthetics: Threat, or Menace?' <http://www.wholeearth.com/issue/2105/article/108/communication.prosthetics.threat.or.menace>, Summer 2001, accessed 12 November 2013
 - (2011a) *Reamde* London: Atlantic Books [kindle edition]
 - (2011b) 'Innovation Starvation' in *World Policy Journal* 28(3), 11-16
- Strahan, Jonathan (ed.) (2010) *Engineering Infinity* Oxford: Solaris [kindle edition]
 - Rajaniemi, Hannu 'The Server and the Dragon' loc 1640-1852
- Stross, Charles (2006) 'What is the Sensory Bandwidth of Scotland?' <http://www.antipope.org/charlie/blog-static/2006/07/what-is-the-sensory-bandwidth.html>, 6 July 2006, accessed 25 July 2013
 - (2008) *Halting State* London: Orbit [kindle edition]
 - (2009) 'Overtime' <http://www.tor.com/stories/2009/12/overtime>, 22 December 2009, accessed 26 July 2013
 - (2010a) *The Atrocity Archives* London: Orbit [kindle edition]
 - (2010b) *The Jennifer Morgue* London: Orbit [kindle edition]
 - (2010c) *The Fuller Memorandum* London: Orbit [kindle edition]
 - (2012) *The Apocalypse Codex* London: Orbit [kindle edition]
- Sutton, Damian, Susan Brind, and Ray McKenzie (eds.) (2007) *The State of the Real: Aesthetics in the Digital Age* London: I.B. Tauris
 - Žižek, Slavoj 'Science of Appearances, Politics of the Real' 181-198
- Suvin, Darko (1979) *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre* New Haven: Yale University Press
- Taylor, Rachel (2012) 'Kusama and Infinity' <http://www.tate.org.uk/context-comment/blogs/kusama-and-infinity> 13 March 2012, accessed 20 November 2013
- Tegmark, Max (1998) 'The Interpretation of Quantum Mechanics: Many Worlds or Many Words?' in *Fortschritte der Physik* 46(6-8), 855-862
 - (2007a) 'Many lives in many worlds' in *Nature* 448, 23-24
 - (2007b) 'The Mathematical Universe' in *Foundations of Physics* 38, 101-150

- Tegmark, Max and John Archibald Wheeler (2001) '100 Years of Quantum Mysteries' in *Scientific American* February 2001, 73-79
- Thurlow, Crispin and Mroczek, Kristine (2011) *Digital Discourse: Language in the New Media* Oxford: Oxford University Press
- Times Colonist (Victoria) (2007) 'Paranoia lampooned in disc's marketing' <http://www.canada.com/victoriatimescolonist/news/arts/story.html> 15 April 2007, accessed 3 February 2014
- Trapdoor, Kara (2010) 'The Gracie Kendal Project-My Life as an Avatar' <http://karasecondlife.blogspot.co.uk/2010/08/gracie-kendal-project-my-life-as-avatar.html>, 8 August 2010, accessed 18 February 2013
- Tryon, Edward P. (1973) 'Is the Universe a Vacuum Fluctuation?' in *Nature* **246**(5433), 396-397
- Turkle, Sherry (1997) *Life on the Screen: identity in the age of the internet* London: Phoenix
- Upton, Ian and Steve Wilkes (2007) *A Passing Moment* 1st May to 30th June 2007, Charlotte Gallery, Eduserve Island, Second Life. Online catalogue
- Valve (2008) 'Portal 2: About' www.thinkwithportals.com, accessed 17 April 2013
- Vasiliev, Danja and Gordan Savičić (2011) *the 120 days of *buntu* Beaver Press
- Veenhof, Sander and Mark Skwarek (2010) 'Augmented Reality art exhibition MoMA NYC (guerrilla intervention)' <http://www.sndrv.nl/moma/>, October 2010, accessed 12 November 2013
- Vighi, Fabio (2012) *On Žižek's Dialectics: Surplus, Subtraction, Sublimation* London: Continuum
- Virilio, Paul (2003) *Art and Fear* London: Continuum
- Walton, Jo (2008a) 'The Singularity Problem and Non-Problem' <http://www.tor.com/blogs/2008/07/singularity>, 22 July 2008, accessed 25 July 2013
- (2008b) 'To trace impunity: Greg Egan's Permutation City' <http://www.tor.com/blogs/2008/09/egan>, 16 September 2008, accessed 25 July 2013
- Weimar, Paul (2013) 'BOOK REVIEW: The Fractal Prince by Hannu Rajaniemi' <http://www.sfsignal.com/archives/2013/07/book-review-the-fractal-prince-by-hannu-rajaniemi/>, 18 July 2013, accessed 24 July 2013
- Wheeler, John Archibald (1998) *Geons, black holes and quantum foam: A life in physics* New York and London: W.W.Norton
- Whitelaw, Mitchell (2013) 'Proto-Computing: An Interview with Ralf Baecker' <http://teemingvoid.blogspot.co.uk/2013/06/proto-computing-interview-with-ralf.html> 8 June 2013, accessed 11 December 2013
- Wright, Elizabeth, and Edmond Wright (eds.) (1999) *The Žižek Reader* Oxford: Blackwell
- Žižek, Slavoj, 'Is it Possible to Traverse the Fantasy in Cyberspace?' 102-124
- Young, Thomas (1802) 'The Bakerian Lecture: On the Theory of Light and Colours' in *Philosophical Transactions of the Royal Society of London* **92**, 12-48
- (1807) *A Course of Lectures on Natural Philosophy and the Mechanical Arts: Volume II* London: Joseph Johnson

Zepke, Stephen (2011) 'The Sublime Conditions of Contemporary Art' in *Deleuze Studies* 5(1), 855-862

Zhang, Ray and Dragan Huterer (2010) 'Disks in the sky: A reassessment of the WMAP "cold spot"' in *Astroparticle Physics* 33(2), 69-74

Žižek, Slavoj (1991) *Looking Awry* Cambridge, MA: MIT Press

- (2000) 'From History and Class Consciousness to the Dialectic of Enlightenment...and Back' in *New German Critique*, 81, 107-123

- (2006) *Interrogating the Real* London: Continuum

- (2007) *The Indivisible Remainder: on Schelling and related matters* London: Verso

- (2008a) *The Plague of Fantasies* London: Verso

- (2008b) *The Sublime Object of Ideology* London: Verso

- (2008c) *Violence: Six Sideways Reflections* London: Profile

- (2009a) *First as Tragedy, Then as Farce* London: Verso

- (2009b) *The Parallax View* Cambridge, MA: MIT Press

- (2009c) *The Ticklish Subject: the absent centre of political ontology* London: Verso

- (2011) *Living in the End Times* London: Verso

- (2012) *Organs Without Bodies: on Deleuze and consequences* London: Routledge

- (2014) 'Keynote: What does it Mean to be a Materialist Today?' in *International Žižek Studies Conference* University of Cincinnati, 4-6 June 2014

Zurek, Wojciech (ed.) (1990) *Complexity, Entropy, and the Physics of Information* Redwood City, CA: Addison-Wesley

- Wheeler, John Archibald 'Information, physics, quantum: The search for links' 309-336

CULTURAL ARTEFACTS

458nm (2006) Jan Bitzer, Ilija Brunck, Tom Weber (dirs.) Germany: Polynoid

Aceti, Lanfranco (curator) (2013) *I Occupy* Kasa Gallery, Istanbul, 15 November-21 December 2013

Albaic, Sergio (2013) *Art is Motion* Lexus

Antonelli, Paola (curator) (2011) *Talk To Me* MoMA, New York, 24 July-7 November 2011; online <http://www.moma.org/interactives/exhibitions/2011/talktome/>

Baecker, Ralf (2009) *The Conversation* various
- (2011) *Irrational Computing* Schering Stiftung, Berlin

Baldur's Gate II: Shadows of Amn (2000) PC. Black Isle: USA

Benayoun, Maurice (1991-3) *The Quarxs* Canal+ [television]
- (1995) *The Tunnel under the Atlantic* Pompidou Centre, Paris; Museum of Contemporary Art of Montréal, Montréal, 19-24 September 1995
- (1998) *Missing Matter* TRANSARCHITECTURES 03: UQAM, Montréal; Galerie AEDES, Berlin; DEAF, Rotterdam
- (1998) *The Paris-New Delhi Tunnel* Nouvelle Image, Nouveaux Réseaux de la Villette, Cité des Sciences et de l'Industrie, Paris, 25 January-8 February 1998
- (2005) *The Mechanics of Emotions* various (on-going projects), including (2010) *Emotion Forecast* online <http://emotionforecast.com/> and (2012) *Occupy Wall Screens* Big Screen Plaza, New York, 31 January-28 February 2012
- (2006) *The Dump* <http://www.the-dump.net/>
- (2006) *Stolen Life* Proposed in *The Dump*
- (2010) *Art Total* Unrealised project in *The Dump*
- (2010) *The Art Collider* CITU; San Francisco Art Institute; Kunst Universität Linz; et al.

Benjamin (2013) *Psycosmorrery* [game/interactive] PC; Mac. *Recherché* Wolverhampton Art Gallery, September 2013.
- (2014) *HeadSpace* [3D digital installation] International Žižek Studies Conference: Parallax Future(s) in Art and Design, Ideology and Philosophy, University of Cincinnati, 4-7 April 2014

Bolognini, Maurizio (1992) *Sealed: Programmed Machines* Atelier Lanterne, Nice, 1992-1998

Braid (2008) Xbox (2009 PC). Number None, Inc. [Jonathan Blow]: USA

Computer Chess (2013) Andrew Bujalski (dir.) USA: Andrew Bujalski

Cirio, Paulo (2012) *Google Street Ghosts* online <http://streetghosts.net/>

Cole, Teju (2014) *Hafiz* Twitter @tejucole 8 January 2014

Coulton, Jonathan (2007) *Still Alive* [Music] in *Portal*
- (2011) *Want You Gone* [Music] in *Portal 2*

Creed, Martin (1999) *Work No.210: Half the Air in a Given Space* various
- (2007) *Work No.628: Half the Air in a Given Space* Hessel Museum of Art, New York, 7 July-16 September 2007

Dead Space (2008) PC; Playstation 3; Xbox 360. EA: USA

De Maria, Walter (1977) *New York Earth Room* New York

Dombis, Pascal (1998-1999) *Rizong* various
 - (2000-2008) *Antisana* various
 - (2000/2008) *Antisana II* Galerie Xippas, Paris, 2000; Block Museum, Chicago, 2008
 - (2002-2004) *Hyper-Structures* various
 - (2006-2013) *Post-Digital Mirror* various
 - (2006-2012) *Spin* various
 - (2008) *Géométries Irrationnelles* Galerie Municipale, Virtry-sur-Seine, 16 March-20 April 2008
 - (2009-2013) *Eurasia (Google_Color)* various
 - (2010-13) *Crack RX* Gallery, Paris, 7 June-20 July 2012
 - (2010-2013) *Post-Digital Surface* various
 - (2011) *What_Next?* Saint Eustache, Paris
 - (2012) *Eurasia* TZR Galerie Kai Brückner, Düsseldorf, 20 April-2 June 2012
 - (2012) *SpamScape* Galerie Janssens, Gent, 16 November 2013-25 January 2014
 - (2013) *Post-Digital Blue* TZY Galerie Kai Brückner, Düsseldorf, 7 September-26 October 2013

Duchamp, Marcel (1917) *Fountain* lost; replicas various

Edge of Tomorrow (2014) Doug Liman (dir.) USA: Warner Bros. Pictures; Village Roadshow

Enikeev, Ruslan (2012) *Internet Map* <http://internet-map.net/> accessed 20 November 2013

Every Day the Same Dream (2009) Flash. Molleindustria: Italy

Framestore/Mars Galaxy (2013) *Chauffeur* (1:01) [television advertisement]

Ginzburg, Carlos (1999) *Homo Fractalus* Leonardo 34(1)

Goverdose 2.0 (2012-2013) *Void* online <http://www.goverdose.com/03/pack/v-o-i-d>

Haacke, Hans (2013) *Gift Horse* St. Martin in the Fields, London, September-November 2013

Half-Life (1998) PC. Sierra Entertainment: USA

I MAED A GAM3 W1TH ZoMBIES 1N IT!!!1 (2009) Xbox 360. Ska Studios: USA

Janssen, Arne Niklas (2005) *Touched by His Noodly Appendage*

Kusama, Yayoi (2011 and 2012) *Infinity Mirror Room – Filled with the Brilliance of Life* Museo Nacional Centro De Arte Reina Sofia, Madrid, 2011; Tate Modern, London, 9 Feb-5 June 2012

Limbo (2010) Xbox 360. Playdead: Denmark

Loom (2010) Jan Bitzer, Ilija Brunck, Csaba Letay (dirs.) Germany: Polynoid

Manriquez, Marko (2012) *Ecology Without Nature* Art Hack Day, 319 Scholes, New York, 26-28 January 2012
 - (2010) *Moss Invaders* ITP Winter Show, NYU, New York

Mattes, Eva and Franco Mattes [0100101110101101] (2001; 2011) *404 – Justice* online <http://pentagon.osd.mil/justice>; TransPrivacy, Düsseldorf, 1 October-20 November 2011
 - (2006-7) *Portraits* Ars Virtua, Second Life, 2006; Postmasters Gallery, New York, 17 February-17 March 2007
 - (2009-10) *Synthetic Performances* Second Life
 - (2010) *Freedom* <http://0100101110101101.org/home/freedom/index.html>
 - (2010) *No Fun* <http://www.0100101110101101.org/home/nofun/>

Mignonneau, Laurent and Christa Sommerer (2002) *Nanoscape* Science + Fiction, Sprengelmuseum, Hannover, 15 December 2002-9 March 2003
- (2002) *The Living Web* Animax Theater, Bonn, 1-26 June 2002
- (2003) *Mobile Feelings* Ars Electronica, Linz
- (2006) *Life Writer* MOCA Museum of Modern Art, Cleveland
- (2007) *Wissengewächs* Baunschweig
- (2012a) *Escape The View* Contemporary Art Space, June-September 2012
- (2012b) *Excavate The View* Contemporary Art Space, June-September 2012

Mignonneau, Laurent Michael Shamiyeh and Christa Sommerer (2008) *Solar Display* University of Art and Industrial Design, Linz

Minecraft (2009) PC. Mojang: Sweden

Nine Inch Nails (2007) *Year Zero* [audio CD] various: Interscope Records; [alternative reality game] <http://yearzero.nin.com>
- (2008) *The Slip* [digital download] Los Angeles, CA: The Null Corporation

Oh, Bryn (2008-9) *The Daughter of Gears* Black Swan, Second Life
- (2009) *Rabbicorn* IBM 3, Second Life
- (2010) *Standby* IBM Exhibit A, Second Life, October 2010-January 2011
- (2013) *Imogen and the Pigeons* Immersiva, Second Life, <http://slurl.com/secondlife/Immersiva> January-October 2013

Pac-Man (1980) arcade. Namco: Japan

Pahute [Upton], Ian (2008) *Shadows* Pahute Island, Second Life, <http://slurl.com/secondlife/Isles%20Las%20Avies/>
- (2008) *The Loneliness of Being* Pahute Island, Second Life

Perfect Dark (2000) Nintendo 64. Rare: UK

Portal (2007) PC; Xbox 360. Valve: USA

Portal 2 (2011) PC; Mac; PlayStation 3; Xbox 360. Valve: USA

Rajaniemi, Hannu and Samuel Halliday (2013) *Snow White is Dead* [neurofiction] Edinburgh Science Festival

Rauch, Barbara and Dew Harrison (2002) *PHYSICAL_CHAT* Watershed Media Centre, Bristol, 2 August 2002; online.

Resident Evil (1996) Playstation. Capcom: Japan

Rez (2001) Dreamcast; Playstation 2. SEGA: Japan

Schomaker, Kristine (2010-12) *1000+ Avatars* online <http://1000avatars.wordpress.com/>; Second Life, <http://slurl.com/secondlife/Coyote/81/163/1430>
- (2010-12) *My Life as an Avatar* online <http://kristineschomaker.net/new-media/comics/>; self-published catalogue

Shortbread, Angrybeth (2006) *Avatar DNA* The Pencil Factory Gallery, Second Life <http://slurl.com/secondlife/The%20Port/31/66/26/>
- (2006) *UUID Polyphony* The Pencil Factory Gallery, Second Life
- (2006) *You Demand Too Much of Me* The Pencil Factory Gallery, Second Life
- (2009) *Gestalt Cloud* Kriti Island, Second Life, <http://slurl.com/secondlife/Kriti%20Island/>
- (2009) *I am Note, We are Music* Kriti Island, Second Life

Source Code (2011) Duncan Jones (dir.) USA: The Mark Gordon Company; Vendome Pictures

South Park (1997-2013) Trey Parker, Matt Stone. Comedy Central

Spore (2008) Windows; Mac. EA: USA

Tetris (1984) arcade. Alexey Pajitnov: USSR

The Graveyard (2008) PC; Mac. Tale of Tales: Belgium

The Matrix (1999) The Wachowski Brothers (dirs.) USA; Australia: Warner Bros.

The Path (2009) PC. Tale of Tales: Belgium

Tron (1982) Stephen Lisberger (dir.) USA: Walt Disney Productions

Upton, Ian and Steve Wilkes (2007) *A Passing Moment* Vivid, Birmingham; Pahute Island, Second Life, <http://slurl.com/secondlife/Isles&Las%Avies>

Vasiliev, Danja and Gordan Savičić (2011) *the 120 days of *buntu* <http://120buntu.com/>

Veenhof, Sander and Mark Skwarek (curators) (2010) *WeARinMoMA* Museum of Modern Art, New York, 9 October 2010

World of Warcraft (2004) PC; Mac. Blizzard Entertainment: USA

WORM Rotterdam (2009) *Web 2.0 suicidemachine* <http://suicidemachine.org/>