The Articulation of the Digital Audiovisual Medium in Online Video

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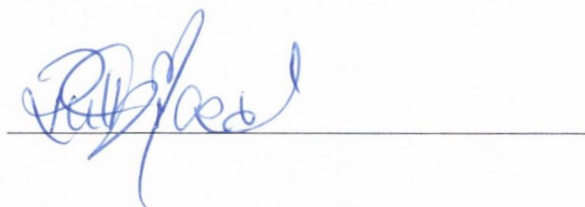
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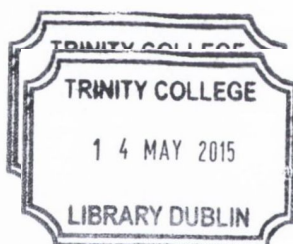
Summary

In contemporary digital culture all media forms have been subsumed into a single technology – digital data. Pre-digital media discourse was concerned with materially bound, and so physically delimited, forms of media. This project addresses the problem of how we can account for the medium in contemporary digital culture. It reviews digital media arts scholarship since the emergence of digital technology, identifying how it has responded to various stages in the development of that technology, identifying the revolutionary, evolutionary, and hybrid aspects of digital mediation, and the initial signs of digital specificity. Also reviewed as part of the literature is André Gaudreault and Philippe Marion's *The Cinema as a Model for the Genealogy of Media* (2002). Applying the stages of medium development that they describe in their model to the trajectory of digital medium development as elucidated by existing scholarship, I identify a correspondence between the development of the digital medium and the preliminary stages of their model – 'irruption' and 'monstration'. Existing scholarship lacked an identification or discussion of the autonomy – the final stage of their model – of the digital medium. Accordingly, I initially asked: in contemporary digital culture, can we account for the autonomous digital medium? In light of the ubiquity and mutability of digital technology, I acknowledge the futility of attempting to define *a* digital medium in the context of media convergence. In order to focus the project of research, I look to the field of online video and refine the project's research question thus: Whether and to what extent does online video articulate the autonomy of the digital audiovisual medium? Adapting Gaudreault and Marion's model for application to online video, I identify, through existing scholarship, the technological specificities of the mediation of online video – digital data, the loop, the interface and the database. Following a method of

empirical research into the field of contemporary online video, I select twelve online videos for analysis, on the basis of their formalisation of one of those technological specificities. Using each of these specificities as tools of analysis, I analyse their formal, conceptual and narrative implications in online video in chapters 3-6. Tracing these implications of the videos' mediating technology, from their inherent qualities to their narrative operation, I establish its technocultural significance. While my analysis successively deals with the inherent, technological, formal, conceptual and narrative aspects of those technological specificities, it notes their contingency on one another. In the final chapter, I synthesise the results of my analyses of online video, noting the contingency of digital data, the loop, the interface and the database on each other as they collectively mediate online video. I also note the reciprocity between the narrative and conceptual implications of more than one of the mediating technology's features, and identify certain parallels between them. In light of the relations of contingency, reciprocity and comparison that I identify within the sample of videos analysed, the project establishes how they exemplify a distinctly digital audiovisuality, and correspondingly, how they articulate the autonomy of the digital audiovisual medium.

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The Articulation of the Digital Audiovisual Medium in Online Video

Digital technologies have utterly changed our concept of the medium from what, in the analogue period, were physically delimited pieces of material and the practices in which they were implicated, to the sequences of binary data (1s and 0s) that now underpin so much of our lives and cultural practices. The following critical analysis of a selection of innovative contemporary online videos examines this area of digital audiovisual practice as a means to redefine how we can conceive of a medium in contemporary times. As such it identifies and critically addresses an area of digital audiovisual production practice that has not yet been recognised by the academy from a media studies perspective. It is important that this burgeoning area of creative practice should no longer be overlooked because it has much to tell us about the kinds of new creative practices that are made possible by digital technology's democratisation of the tools of production, distribution and consumption. In addition, the videos studied are particularly relevant for study because of what they reveal about the cultural, social and political specificities of our time, given the unprecedented scope of digital media as it pervades so many of our lived experiences.

Comprehending the formal, conceptual, narrative and institutional specificities of the use of a particular media technology, the *medium autonomy* stage of Gaudreault and Marion's model of the genealogy of media (2002) provides an adaptable methodology of analysis according to which these interrelated features of online video can be identified and examined. This research project asks an overriding question: Whether and to what extent does online video articulate the autonomy of the digital audiovisual medium?

Taking the formal innovation of online videos as a criterion of selection, I then critically examine the technological, conceptual and narrative specificities of these features in light of the technocultural specificities of its facilitating technology in the contemporary period of digital culture. As a result of a process of empirical research into the field of practice, I identified four unconventional formal features of online video: the glitch, the loop, the interface and the database. Using these four features as analytical tools, the ensuing analysis of online videos centres on the following questions:

1   How is the glitch, loop, interface or database audiovisually formalised in the videos?

2   How does the formalisation of the glitch, loop, interface or database relate to the digital technologies that underpin the digital arts and online space?

3   What conceptual implications does the audiovisual formalisation of the glitch, loop, interface or database introduce to the videos?

4   What narratives does the interrelation of the formal the glitch, loop, interface or database with the other content of the videos produce?

Rather than suggesting that the glitch, the loop, the interface and the database are entirely new formal innovations resulting from digital technology, the analysis that follows examines these features in relation to the specific technocultural context from which they have emerged. Chiefly, this context comprehends the digital network through which we access and engage the subject of research - online videos - and importantly, how we access and engage our shared culture. This project of research establishes how the videos selected for analysis formally, conceptually and narratively articulate the cultural, social and political specificities of the digital technologies of the network that now mediates so much of our lives.

The online videos that I selected for analysis in this research project are:

flo\/\/ (2011), v5mt (dir.), Poland.

Glitch (2010), Soderberg, D. (dir.), USA.

HARDCORE_GLITCH (2009), LePôLe (dir.), France.

Kaizer (2006), Tanaka, K. (dir.), Japan.

LoopLoop (2008), Bergeron, P. (dir.), Canada.

Metro: Paris - Hong Kong underground (2009), Delalex, G., Moreau, Y. and Wessel
        Cessieux, T. (dir.), France/Belgium/UK.

Moonwalk (2008), Kohout, M. (dir.), Czech Republic.

My Favorite Color (2011), Kutiel, O. (dir.), Israel.

Noteboek (2008), Lohbeck, E. (dir.), the Netherlands.

Please Say Something (2009), O'Reilly, D. (dir.), Ireland/Germany.

Wu Tang Clan Mixtape (2010), Eclectic Method (dir.), UK.

zZz | Grip (2009), Wouters, R. (dir.), the Netherlands.

The videos are all available on the website http://digitalaudiovisuality.com, which I designed and built in order to promote my research. Each of the video analysis chapters of the thesis (chapters 3, 4, 5 and 6) relates to a separate page on the site – Glitch, Loop, Interface, Database – where the videos under analysis can be viewed. Ideally, each of the videos should be viewed before reading their analysis in the pages that follow. There is a link to the appropriate page of the website in the introduction section of each of the analysis chapters. (The references for the videos given in the bibliography to this thesis refer to the videos' original online publication.)

Introduction

There are not many media left, but only one medium, as different media have converged and fallen prey to a single network of computers.

'Vision Possible: A Methodological Quest for Online Video'
Stefan Heidenreich (2011)

Stefan Heidenreich astutely recognises the penetration of digital data throughout contemporary digital culture, in which diverse media types have been subsumed into digital technologies. His use of language in the epigraph raises an important issue, however: if different media have, somewhat paradoxically, converged into one medium, then how can we account for the medium in contemporary digital culture? Deeming a single network of computers – in other words, the Internet – *the* medium does not enable us to account for the apparent differences between media practices that have converged within, and emerge from, that digital network.

To abandon the concept of the medium, according to which different technological arts practices can be individuated, to the amorphous virtual realm of the Internet, is to deny the differences between the many digital media arts practices that coexist there, on the basis that they are all rooted in digital data. Digital data is a form of technology. Despite its use in vernacular and scholarly discourse, the term *medium* is not conceptually interchangeable with *technology*. Rather, it comprises the means and forms of creative expression and the practices of production, reception and distribution that develop around a particular use of a particular technology. To give an example from pre-digital media culture: photography and film were both based in celluloid film technology, but constituted distinct media because of the distinct formal and cultural practices that developed around the use of that technology. Now, of course, photography and film have been subsumed into digital data, which has significant implications for how we understand these media forms.

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As has already become clear in this discussion, it would be impractical to attempt to speak about practices involving pre-digital or digital technology without using the terms *medium* or *media*. This is because these terms open up a conceptual space within which the formal and cultural specificities of distinct technological arts practices can be discussed and coherently analysed.

Given the centrality of digital technology in contemporary culture – accordingly termed *digital culture* – and the discernably diverse and abundant media forms that are rooted in that technology, it would be absurd and unproductive to discuss all digitally mediated media forms collectively as *a* medium. Rather, they are different types of media, evidenced by the distinct formal, cultural and production practices that evolve around a particular use of digital technology. It would be both practically and critically unfeasible to propose that there is one medium – digital data – and to thereby claim that the different practices that evolve around a particular use of that data are irrelevant. Because of this necessary reciprocity between the technology and its uses and practices, the medium should be technoculturally defined.

For example, it would be invalid to discuss the multiplayer online game – *Call of Duty*, the video-streaming website – *Vimeo*, and the news blog – *Politico*, as though they were the same medium, rather than different media. While they are all rooted in digital data and all exist (virtually) online, and so can be collectively categorised as websites, they are resolutely different media forms. This is due to the different functionalities and uses of those websites, the individual user experiences that they produce, and the social, political and cultural practices that they involve, and have evolved around their particular uses of digital data. As this example highlights, there are so many variations even within a seemingly singular media category of 'website' that it is practical to discuss them in terms of different media practices: gaming, video

viewing and news journalism, respectively. Also, as almost everything that we engage online can be termed a website, this category is as useful to digital media criticism as Heidenreich's all-encompassing concept of the digital network as *the* digital medium.

We can identify a multiplicity of different media types throughout the digital network. It is currently dominated by online video, a broad category of audiovisual media practices and cultures that occupy the virtual realm. The ascendency of online video was marked by the sale of *YouTube* to *Google* for $1.65 billion in 2006, and by the number of people viewing online video in the US reaching 50.5% of the population in 2011.[1] Online video viewing is now the pre-eminent activity of digital network users. The latest figures show that online video access now accounts for 50% of all peak period Internet traffic,[2] and online video traffic is set to be 55% of global consumer Internet traffic in 2016.[3] [4]

Within this expansive category – online video – there are a multitude of distinct audiovisual media types, spanning commercial film and television, to independent and amateur audiovisual practices. These audiovisual practices variously demonstrate the specificities of their mediating digital technologies. Digitised versions of pre-digital audiovisual media – in digital film archives, for example, and digitally mediated existing media forms – such as video clips taken from music videos

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[1] Data retrieved from www.emarketer.com, accessed 12/09/12.

[2] Data retrieved from 'Global Internet Phenomena Report: 2H 2013', available at http://www.sandvine.com/trends/global-internet-phenomena/, accessed 03/12/2013.

[3] Data retrieved from: 'Cisco Visual Networking Index: Forecast and Methodology, 2012–2017', available from www.cisco.com.

[4] Despite the significant data that has been generated in relation to online video viewing figures and demographics in general terms, there is a paucity of analysis of the numbers viewing various genres within this very general category. Some video streaming sites are allied with certain established sub-categories or genres of online video. For example, *vimeo.com* hosts what could be classified as *art* video and *supercut.org* hosts supercut videos that have a particular style of editing and construction. Therefore, the viewing figures from these sites could be argued for as indicative of the popularity of online video art or the supercut. Having established the digital specificity of the online videos under discussion in this thesis, it would be a fruitful future project of research to develop a robust means whereby the numbers viewing digital audiovisuality - the genre of online video that is proposed and established by the critical analysis undertaken in this thesis - could be generated.

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and advertising, film and television, assert the specificity of their underlying digital technology in its recontextualisation of those existing media forms in the virtual realm. In addition to those types of online video that use digital technology to deliver otherwise unaltered analogue forms of media content, however, new, specifically digital, audiovisual media forms have begun to emerge from the digital network.

Gaudreault and Marion's model of the genealogy of media (2002) delineates stages of the development of a technology into a medium. Recognising a number of demonstrably different stages in the development of the cinematic medium, they use the model to identify its 'emergence' (the irruption, or invention, of a technology), its 'monstration' (where it begins to show the first signs of its autonomy) and finally, its 'constitution' as an autonomous, or singular, medium.

In Chapter 1: 'Digital Media Arts Scholarship Reframed', I review digital media arts scholarship in order to trace existing critical perspectives on the digital medium from the emergence of the new digital technology in the late twentieth century, to theories of digital specificity of the current period. Like Heidenreich, his antecedents consistently refer to 'the digital medium', without acknowledging its inherent diversity. Having reviewed Gaudreault and Marion's model of the genealogy of media as a contribution to the scholarship, I observe the pertinence of its stages of media development to the discussion of a digital medium, in a broad sense, throughout the scholarship. Scholars who identified and theorised revolutionary, evolutionary and hybrid digital media and digital medium specificity, inadvertently provided evidence of the irruption and monstration periods in the development of the digital medium. Continuing their broad perspective, I ask: in contemporary digital culture, can we account for an autonomous digital medium?

In Chapter 2: 'Technocultural Articulation of the Medium', I adapt Gaudreault and Marion's criteria for the autonomy of a medium for application to the digital media arts. Acknowledging the unfeasibility of an attempt to establish *a* digital medium, I look to the burgeoning field of online video to test the applicability of the model's earlier stages to established online video practices that have emerged from the network. I find a marked applicability of the model's irruption and monstration periods to the viral video [5] genres of cute animals/babies, epic fails, funny/embarrassing, spoofs and memes[6], and the fan labour practices of vidding[7] and machinima.[8] While these online video practices exploit digital technology's potential for new production practices and distribution and access models, being streamed, shared and sometimes even produced, on the digital network, they tend to reproduce the pre-digital formal and narrative conventions of audiovisuality through those technologies.

Their formal and narrative convention, the vestiges of the commercial concerns of industrial audiovisuality, combined with innovative production, distribution and access models, has facilitated the popular reception of these established online video practices. Such practices tend to be socially defined. Viral video is so-called due to the number of times it has been shared between users online, through email or social networks. Its formal and narrative conventionality and thus, familiarity, facilitates the videos' ease of reception and dissemination. Vidding and machinima are fan labour video practices; in other words, they emerge within fan community cultures and are typically shared amongst community members. Fan labour video practices typically maintain formal and narrative conventions of their

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[5] A video that becomes popular through person to person sharing using digital platforms.
[6] An appropriation of Richard Dawkins' concept of a meme in *The Selfish Gene* (1976) to explain the way cultural information spreads. Internet memes are specific to digital culture.
[7] Using found footage that is typically edited to music.
[8] Using real-time 3D computer graphics rendering engines, typically from video games, to create video.

source material in their appropriation of the themes, icons, narratives and diegeses of existing media texts or games.

Given online video's penetration of the public realm and the significant social dimension of those established online video practices, considerable scholarly attention has been paid to online video from a social science perspective,[9] which critically analyses the human dimension of online video viewing, production and distribution. What is needed as a counterpart to existing, overwhelmingly humanist,[10] research into online video, is a project of research that takes into account the hitherto neglected, technologically centred, necessary counterpart of online video practices – the medium. The current research project fills this void in contemporary research into online video by critically addressing the concept of the medium in the context of online video. It asks: in contemporary online video, can we account for an autonomous digital audiovisual medium?

Adapting Gaudreault and Marion's criteria for medium autonomy for application to online video in chapter 2, I establish its institutional context – the Internet, and its technological specificities – glitch, loop, interface and database, and establish the formal, conceptual and narrative articulation of these specificities as the hallmark of the autonomous digital audiovisual medium. Using those technological specificities – glitch, loop, interface and database – as the conceptual tools of research, I implement empirical research into the field of online video following a method of hyperlink surfing, metadata (tag) searches and search engine retrieval. Gathering

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[9] For a selection of recent academic studies, see the bibliography for this chapter.

[10] The term humanist has multiple meanings depending on the context in which it appears. It is used here as a means with which to describe the bounds of the current study and to make a distinction between the theoretical approach of this study and that of the predominant approach of existing research into online video. The majority of that research has studied online video as a means to understand the identity of the human element of its production or consumption. This research project, by contrast, studies online video as a means to understand the technological specificities of its production and of its cultural context. I therefore use the term *humanist* to distinguish the former studies of human identity in relation to online video, from the current study, which is concerned with the identity of the digital medium.

twelve exemplary videos from the field that formally articulate those technological specificities, I then analyse the formal, conceptual and narrative implications of their articulation of these specificities in the subsequent four chapters.

I analyse three different online videos in each of the analysis chapters (Chapters 3 - 6). Each follows the same analytical structure. I initially establish the creative context of each of the videos chosen in relation to the bodies of work of the artists responsible. I then establish the inherent specificity of the glitch, the loop, the interface or the database – in other words, its specific features, as it exists (virtually) as an entity in the world. I consider the relationship between the inherent specificity of the technological feature and its formalisation in each of the three videos. I then analyse the technological specificity of the glitch, the loop, the interface or the database, or how it works, and its formal articulation in each video. Following that, I consider the conceptual implications of each feature, which derive from our cultural engagement with these specific aspects of digital technology, and how their formalisation draws its conceptual implications into the audiovisual narrative.[11] Finally, I analyse the narrative implications of the formal interrelation of each of the technological features with the other content of the videos in which they appear.

In Chapter 3: 'Glitch', I analyse the technological, formal, conceptual and narrative significance of the glitch in *HARDCORE_GLITCH* (2009) by LePôLe, *floVV* (2011) by v5mt and *Glitch* (2010) by David Soderberg. In Chapter 4: 'Loop', I analyse the technological, formal, conceptual and narrative significance of the loop in *Kaizer* (2006) by Kotaro Tanaka, *LoopLoop* (2008) by Patrick Bergeron and *Metro: Paris - Hong Kong underground* (2009) by Gilles Delalex, Yves Moreau and Thomas Wessel-Cessieux. In Chapter 5: 'Interface', I analyse the technological, formal,

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[11] Here the term 'narrative' does not refer, as tends to be the case in film studies, to conventional film narrative, elsewhere termed classic Hollywood narrative. Rather, I use it to refer to storytelling in its general sense, as in literary or musical narrative.

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conceptual and narrative significance of the interface in *zZz | Grip* (2007) by Roel

Wouters, *Moonwalk* (2008) by Martin Kohout and *Noteboek* (2008) by Evelien

Lohbeck. In Chapter 6: 'Database', I analyse the technological, formal, conceptual

and narrative significance of the database in *Please Say Something* (2009) by David

O'Reilly, *Wu Tang Clan Mixtape* (2010) by Eclectic Method and *My Favorite Color*

(2011) by Kutiman. In each of those chapters, despite the logical path through the

technological, formal, conceptual and narrative significances of each feature that my

argument traces, I observe how these significances are contingent on one another.

In Chapter 7: 'Conclusion: The Digital Audiovisual Medium', I summarise

and synthesise the results from my preceding analyses of the glitch, the loop, the

interface and the database in online video in order to establish the autonomy of the

digital audiovisual medium. I establish the autonomous digital audiovisual medium in

relation to the sphere of online video practice that these videos exemplify, rather than

in relation to individual videos. Given its comprehensive digital specificity, in terms

of its formal features, their conceptual implications and the audiovisual narratives that

are produced as a result, I assert the autonomy of the digital audiovisual medium in

relation to the distinct audiovisual media practice that it establishes – digital

audiovisuality. Finally, I consider the future potential of the results of my research

into online video, of the research methodology that I have pioneered in this study for

application to other digital media arts, and the types of research projects that would

benefit from similar methodological approaches to digital media.

Throughout this study, I use the term audiovisuality to describe the entire field

of historical and contemporary practices in the audiovisual media arts. This term is

better suited than other terms that have been proposed throughout scholarship, such as

cinema (Youngblood 1970), animation (Manovich 2001) and cinematographic circuit

(Menotti 2012), which are too specific to particular technologies, and to particular technological practices, to usefully account for the entire field of study.

Throughout the period of this project of research I presented papers based on that research at ten international conferences. From my initial research into the field of online video, I presented a paper entitled, 'The Influences of New and Old Technology upon Online Music Video – A Case Study' at the *International Association for the Study of Irish Literatures* conference at NUI Maynooth in July 2010.

I presented research that underpins Chapter 3: 'Glitch' in 'Glitch, a Post-Digital Genre' at Genres in Transit: Rethinking Genres in Contemporary Cinemas, at Arts Technology Research Laboratory (ATRL), Dublin in April 2012; in 'The Glitch: A Study in Post-Digital Audiovisual Aesthetics' at the *European Popular Culture Association (EUPOP)* conference, London University of the Arts in July 2012; and in 'Glitch as Interstitial Practice', at the *Alphaville* conference: *Cinema in the Interstices*, University College Cork in September 2012.

Research that underpins Chapter 4: 'Loop' was presented in 'Scratch, a Study in Digital Audiovisuality' at the *Avanca Cinema* Conference in Portugal, July 2012 and in 'The Loop - Audiovisual Practice in and of Digital Space' at *Media, Communication and Cultural Studies Association (MECCSA) 2013: Spaces & Places of Culture*, at the University of Ulster, Derry in January 2013.

I presented research that underpins Chapter 5: 'Interface' in 'The Man-Machine' at the *Dancing with Fire: Technology, Performance, Objects and Environments* symposium at ATRL, Dublin in May 2012; in 'Digital Audiovisuality: the Aesthetic Expression of Digital Engagement' at the *MeCCSA PGN* conference, at

Loughborough University, UK in September 2012; and in 'User-Interface-Art' at *Display: Consume: Respond - Digital Engagement with Art*, the Computers and the History of Art (CHArt) 28th Annual Conference, London in November 2012.

Research that underpins Chapter 6: 'Database' was presented in '*Please Say Something* (2009): An Aesthetic Interpretation of Popular Culture' at the *Ireland and Popular Culture* conference at Reims University, France in October 2012.

Some of my research has also been published in international peer-reviewed publications. An extended version of 'Scratch, a Study in Digital Audiovisuality' was published in *Avanca | Cinema 2012*'s book of conference proceedings in 2012. I wrote a chapter entitled '*Please Say Something* (2009): Digital Aesthetics and Popular Culture', for the book *Ireland and Popular Culture*, published in 2014. An extended version of the research paper 'User-Interface-Art' will be published in *The CHArt Yearbook* in 2016.

Chapter 1:   Digital Media Arts Scholarship Reframed

… virtual art is the artistic interpretation of some contemporary issues, not only with the aid
of such technological developments but through their integration with them.

Frank Popper
From Technological To Virtual Art (2007)

Digital media arts scholarship has developed according to five key thematic trends.

The revolutionary potential of digital technologies inspired techno-utopian rhetoric

and future oriented methodologies of analysis. The evolutionary development of

digital technologies inspired methodologies of digital arts research that were shaped

by theory relating to their originating features, music, art, film or video, for example.

Digital media arts began to display features that recalled similar features in pre-digital

media *and* those attributable to the specificities of digital technologies. Accordingly,

a trend emerged in digital media discourse that attended to the characteristic hybridity

of millennial digital media arts, in which the formal features, representational

strategies and occasionally, entire texts, of analogue media were remediated[12] by

digital technologies. The dialectic of evolutionary and revolutionary features in

hybrid media problematised the concept of the medium, which was largely materially

defined before the advent of digital technologies. The field of scholarship, which

considers the technological features of the arts in relation to their formal and

representational strategies, is rooted in the concept of medium specificity, whose

definition has been destabilised by virtual and mutable digital data. Emerging in

response to this have been studies concerned with identifying aspects of the

specificity of digital technology.

As with the current research project, the following projects of research into

digital media arts and culture necessitated the formulation of innovative

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[12] See Jay David Bolter and Richard Grusin *Remediation: Understanding New Media* (1999), discussed
later in this chapter.

methodologies appropriate to the objects of study. The unique technological basis of the digital media arts enabled the free interdisciplinarity with which they are practiced, and finds parallel in the interdisciplinary methodologies of critical analysis that have emerged within, and now typify the field of discourse. The following literature review establishes the theoretical context of the current project, which similarly traverses formal, technological, cultural and philosophical discourse.

1.1   Revolutionary Digital Media – Techno-Utopias

Propitious exposition characterised early digital media arts scholarship. Many of its authors, enthralled by digital technology's underdeveloped potential to revolutionise the means of cultural production, distribution and access, hypothesised its future. This stylistic approach characterises scholarship of the 'two major waves of techno-utopianism' (Robins & Webster 1999: 84) spanning the 1980s and 1990s – in particular, Steven Holtzman in *Digital Mantras: the Languages of Abstract and Virtual Worlds* (1994) and *Digital Mosaics: The Aesthetics of Cyberspace* (1998), and Timothy Binkley in 'The Quickening of Galatea: Virtual Creation without Tools or Media' (1990a) and 'The Vitality of Digital Creation' (1997) – but was also central to Gene Youngblood's research into 1960s electronic and digital media in *Expanded Cinema* (1970). Despite their lack of evidentiary support, many of their predictions for digital arts and culture were astute and surprisingly prescient.

A pioneer of digital media arts discourse, Youngblood articulates his philosophy of the technological transformation of the arts in *Expanded Cinema*. Drawing on the central thesis of Marshall McLuhan's foundational study *Understanding Media: the Extensions of Man* (1964), which was concerned with the cultural-political significance of the specific characteristics of various media rather than of the content they carried, Youngblood similarly focuses on the 'formal essences' of media (McLuhan 2001: 116). He argues for the correlation of the formal essences of the electronic and digital arts and the environments of the intermedia[13] network, and an emerging global consciousness.

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[13] The term 'intermedia' coined in the 1960s by Fluxus artist Dick Higgins to refer to interdisciplinary arts practices later became chiefly associated with media arts practices. See Dick Higgins, 'Intermedia' (1966); Dick and Hannah Higgins, 'Intermedia' (2001); Yvonne Spielmann 'Intermedia in Electronic Images' (2001); Mette Ramsgard Thomsen, 'Positioning Intermedia: Intermedia and Mixed Reality'

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By analogy to Pierre Teilhard de Chardin's concept of the noosphere[14] – the conceptual sphere of human thought that similarly envelops the globe – he theorises synaesthetic (expanded) cinema, which comprises special effects, computer art, video art, multimedia environments and holography. Using a theoretical model rooted in computing, thermodynamic and cybernetic theory, and film, television, video and imaging theory, he analyses a sample of contemporaneous synaesthetic cinema in order to chart his complex conceptual reciprocity of the noosphere and the burgeoning intermedia network. He identifies a detachment of the noosphere from cinema's representational strategies, noting the inadequacies of cinema's aesthetic conventions to model the (then) new experiences of engagement with that network.

He explains how, being a commercial product, conventional cinema trades on memory in order to satisfy an assumed pre-existing desire in the audience and is therefore unfit to aesthetically respond to the changing cultural landscape. By contrast, synaesthetic cinema's formal and representational innovations aesthetically model the specificities of digitally mediated experience. He finds that the formal innovations of expanded cinema fuse design information (experiences) with conceptual information (ideas) in the formation of what he describes as 'the experiential information of aesthetic conceptual design' (Youngblood 1970: 62). He argues that the development of human consciousness is enmeshed with advancing media technologies. Digital media's expansion of cinematic language offers new ways in which to perceive and consider the experiential specificities of a period of cultural transformation, forming an aesthetics of expression appropriate for an

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(2002); Julianne S. Sumich, *Conceptual Fusion. Coleridge, Higgins, and the intermedium* (2007); Ginette Verstraete, 'Intermedialities: A Brief Survey of Conceptual Key Issues' (2010); Ágnes Pethő, 'Intermediality in Film: A Historiography of Methodologies' (2010); Jürgen E. Müller, 'Intermediality and Media Historiography in the Digital Era' (2010).

[14] Youngblood borrows this term from Pierre Teilhard de Chardin's *The Phenomenon of Man* (1959) [*Le Phénomène Humain* (1955)]. Pierre Lévy later developed a similar concept he termed 'collective intelligence' in *Cyberculture*, (2001).

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increasingly technologised world. Consequently: 'Aesthetic application of technology is the only means of achieving new consciousness to match our environment' (*Ibid.* 189).

There are inconsistencies in his argument. For example, he states: 'the more information concerning the human condition that the artist is able to give us, the more energy we have with which to modify ourselves and grow in accord with the accelerating accelerations of the living present' (*Ibid.* 63-4). 'Accelerating accelerations' refers to the new temporalities introduced by digital technologies. But he subsequently notes that with the advent of cinema, we 'had to wait until our consciousness caught up with our technology' (*Ibid.* 75). If synaesthetic cinema is the aesthetic expression of our experiences in and of the noosphere, then how can we account for the disconnection of technology and consciousness, and of artist and audience, which he describes? Also, if the latter claim were accurate, then our immersion in conventional cinema would undoubtedly impede the development of cognitive faculties with which to recognise the aesthetic innovation of expanded cinema.

Despite these inconsistencies in his research, Youngblood initiated critical discourse concerning – what were – peripheral audiovisual practices and technologies, and the development of interdisciplinary methodological models for their study. His research is crucial for its conceptualisation of a global intermedia network that would later be founded by digital technologies.

In *Digital Mantras: the Languages of Abstract and Virtual Worlds*, Holtzman similarly attempts to define the 'radical new paradigm' of expression idiomatic to the

digital network (1994: 241). His formal analysis[15] of the abstract structures and environments of virtual space is underpinned by a methodological synthesis of music, computing, art and linguistic theory, and aspects of western philosophy and eastern mysticism. His finds the fundamental commonality of digital music and art, virtual reality and artificial intelligence in their facilitating digital technologies, which facilitate the expression of 'what was not conceivable before computers' (*Ibid.* 250).

In *Digital Mosaics: The Aesthetics of Cyberspace* (1998), he attempts to define a future aesthetic resulting from the 'new paradigm' of expression in contemporaneous digital arts practices. Drawing on exemplary works from computer artists, composers and designers that exhibit various indications of its potential future aesthetic, he considers how the digital environment transforms the relationship between artist and audience, and strategies of representation. He views these diverse digital artworks as interconnected nodes on the digital network that delimits cyberspace, forming the 'digital mosaic'.

The term mosaic describes the paradoxical fragmented cohesion of those nodes in the network, and also implicates McLuhan's concept of the mosaic, or 'cool media', as comprising a 'highly participational form of expression' (McLuhan 2001: 24-35; 179). Exploiting Vannevar Bush's structural theories and his concept of memex, a hypothetical proto-hypertext system of collective memory,[16] Ted Nelson's pioneering hypertext and hypermedia theory,[17] Marvin Minsky's concept of cognitive hyperlinks in his theory of natural intelligence[18] and Douglas Rushkoff's idea of the

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[15] This should be distinguished from a *formalist analysis* whose focus would be (typically) limited to the visual aspects of a work of art without reference to any external factors such as representation, context, artist's biographical details, and so on. By contrast, *formal analysis* describes the attention paid to the formal aspects of a work of art that initiates a deeper critical engagement. This methodology was first detailed by Roger de Piles in *The Principles of Painting* (1743), and later developed by Roger Fry in *Vision and Design* (1920).

[16] Vannevar Bush, 'As We May Think' (1945).

[17] Ted Nelson, *Literary Machines* (1981).

[18] Marvin Minsky, *The Society of Mind* (1988).

'jump' or the nonlinear experience of the cyberculture,[19] Holtzman exposes the aesthetics of the integration of human beings and digital media technologies in cyberspace.

Examining the aesthetics of the virtual, wired, animated and software worlds that comprise the digital mosaic in light of the technological specificities of digital media: ephemerality, reproducibility, programmability and virtuality,[20] he finds that these 'worlds have the potential to express startling ideas and profound emotions in a way no other medium for human expression can' (Holtzman 1998: 15). He emphasises the necessary collaboration between technology and human being in the operation and evolution of these worlds, which simulate time, space, reality and community. Each world has individual forms and philosophies of design, but they are nonetheless rooted in the homogeneous binary code that unites each part of the mosaic.

In the low resolution imaging of the period, whose often highly pixelated appearance revealed the limitations of its facilitating digital technology, he finds the aesthetic essence of the digital in the reciprocity of its technological capabilities, its formal features and their reception. As a result of his analyses of the digital's aesthetic essences, he hypothesises a future digital aesthetic in which these 'ingredients will suddenly mix in a way whose explosive impact is greater than anything apparent in the nature of the medium' (*Ibid.* 129). This will result from a technical mastery of digital technology, whose essential specificities are fundamental to the mosaic, in which 'the structure of the relationships between every part emanates an integrity that is the essence of new digital worlds' (*Ibid.* 190).

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[19] Douglas Rushkoff, *Cyberia* (1994).

[20] Oliver Grau would later contest the specificity of virtuality to digital technologies in *Virtual Art: from Illusion to Immersion* (2003). However, his comparative historiography of pre-digital and digital media arts was concerned with the conceptual virtual relationship between artwork and viewer rather than the ontological virtuality of digital immateriality that Holtzman considers.

Despite the speculative tone of his research, his analysis of these worlds crucially reveals their fundamental cohesion despite their apparent differences, illuminating the domain of digital arts practice as a technological and aesthetic network that places the human being at the centre of the communicative process both physically, in interactivity, and theoretically, as the subjective frame[21] of the innumerable arts of cyberspace.

Binkley's contemporaneous research, in 'The Quickening of Galatea: Virtual Creation without Tools or Media' (1990a) and 'The Vitality of Digital Creation' (1997), is similarly concerned with the digital creative environment, specifically, the impact of the burgeoning use of digital technologies in visual arts practice.

In 'The Quickening of Galatea' he compares digital arts practices to pre-digital practices – film, video, photography and painting – in order to distinguish the digital arts through their specific practices and contexts of reception. He analyses an interactive installation,[22] a computer-rendered drawing,[23] an abstract animation,[24] a picture generated by Harold Cohen's AI-based drawing programme (1989) and NASA's *VPL DataSuit* and *EyePhone* computerised clothing (1989). In so doing, he tests the relevance of theoretical discourses of art, such as conceptualism, pluralism, simulation and metadiscourse, for the analysis of these digital arts.

Resulting from his research, he deems digital data, not the computer, as the medium of those diverse digital art forms, whose 'paradoxically absent presence' has nonetheless become 'a culturally determined channel of communication' (Binkley

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[21] See Mark B.N. Hansen's interpretation of Bergson's theory of subjective perception and the body as 'centre of indetermination' in *New Philosophy for New Media* (2004).
[22] Grahame Weinbren and Roberta Friedman, *The Earl King* (1983-86).
[23] Alvy Ray Smith, *White Sands* (1984).
[24] Maureen Nappi and Dean Winkler, *Continuum 1: Initiation* (1989).

1990a: 234; 236).[25] Due to mutable digital data, the 'conventions by which art is communicated shade into one another, and there are no more tidy territories', and media themselves are '"conceptualized" by the computer' (*Ibid.* 238). He identifies the 'quickening'[26] of the digital arts, or the first stirrings of their future development, in the specificities of digital data.

In 'The Vitality of Digital Creation' he analyses the expression of these specificities in digital art, using a theoretical model rooted in David Freedberg's research into human responses to art[27] and scientific theory concerning fractals, evolutionary art and computation.[28] He acknowledges the 'apparent contrariety' of such a research methodology based in art, science and computing discourse, because 'the aesthetic principles that guide our appreciation of pictures have no relevance to plying digits, and the mathematical rules that govern reasoned formulae have no bearing on understanding art' (Binkley 1997: 107). Nevertheless he observes how the increasing involvement of computers in arts practice directly challenges this notional dualism, 'as they interpenetrate the image and the viewer to merge representation and reality in a new way' (*Ibid.* 108).

In his critical comparative study of the representational strategies of digital and pre-digital visual arts practices, he identifies the specificity of the digital image in its symbiotic connection of a visible percept and an invisible mathematical concept

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[25] This echoes Youngblood's contemporaneous assertion: 'the computer [...] has no meaning, no intrinsic nature, identity, or use-value until we talk it into becoming something by programming it' (1989: 11).

[26] Binkley explicitly acknowledges the source of this term in the Greek myth of Pygmalion. However, it might also refer to the rhizomatic integration of these characteristically diverse digital arts, as in *quickening grass,* although this potential interpretation is unacknowledged. The rhizome image of thought developed by Gilles Deleuze and Félix Guattari in *A Thousand Plateaus: Capitalism and Schizophrenia* (1988), and was later adopted by numerous media arts theorists to describe a similar structure in digital media technologies. See for example, Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (2005), discussed later in this chapter.

[27] David Freedberg, *The Power of Images: Studies in the History and Theory of Response* (1991).

[28] See Benoit Mandelbrot, *The Fractal Geometry of Nature* (1977), Leonard M. Adleman, L.M., 'Molecular Computation of Solutions to Combinatorial Problems' (1994), Alvy Ray Smith, 'Plants, Fractals, and Formal Languages' (1984), Stephen Todd and William Latham, *Evolutionary Art and Computers* (1992).

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(binary code). Consequent to this fundamental condition of all digital mediation, he identifies virtuality and interactivity as two characteristics specific to digital technologies and to the digital arts. These specificities signal 'fundamental changes in the way culture is practiced and preserved' (*Ibid.* 115). Virtuality and interactivity are enabled by the unique relation of art and mathematics in digital art, wherein the underlying data opens the digital media artwork to potentially infinite modifications.

1.2   Revolutionary Digital Media – Persistent Conventions

Tempering the propitious perspective of the techno-utopians, Seán Cubitt, Kevin Robins, Frank Webster and Anna Everett acknowledge the revolutionary potential of these technologies, but nonetheless identify an important distinction between that potential and their real world application, which they observe, continues to maintain cultural conventions and dominant ideologies.   In *Times of the Technoculture: Information, Communication, and the Technological Order* (1999), Robins and Webster consider the continuity of these conventions and ideologies throughout the development of the media. Cubitt's cultural materialism in *Digital Aesthetics* (1998) identifies corporate and political domination of the digital network, through which he paradoxically envisages our technologically determined emancipation. Everett's later contribution, 'Click This: From Analog Dreams to Digital Realities' (2004), counterbalances their holistic approaches by attending to the ideology of a specific aspect of digital aesthetics and culture.

In *Digital Aesthetics* (1998) Cubitt focuses on the social and cultural ramifications of the advent of digital technologies, whose revolutionary means of creative expression, representation, reception, distribution and access, he finds, facilitate the perpetuation of dominant ideologies and the expansion of the global corporation. He nonetheless proposes that from within this conventional ideological system, the aesthetic potential of these technologies could be realised through peripheral arts practices that challenge social inequalities. He attributes greatest aesthetic significance to arts practices that exploit the specificities of digital technology to express this 'utopian realism' by modelling cultural alternatives that 'owe nothing to the structures of domination' (Cubitt 1998: x). His methodology draws on aesthetic philosophy, media theory, and

cybertheory to analyse a sample of contemporaneous digital arts practices that, according to diverse formal strategies, express the 'pursuit of an ethical mode of being in despite of [*sic*] the conditions in which we find ourselves' (*Ibid.* ix).

His comparative historiography of a wide range of media traces: the roots of reading from volume-bound text, through the library catalogue to hypertext; ways of seeing from the windows of trains, maps and film to the modularised images of cyborg vision; spatiality from baroque ceilings, perspective painting and immersive VR systems; the transformation of sound from live performance, through broadcasting and film to installation art; and the changing notion of community due to developments in digital network technologies, particularly the internet, and in the convergence of the media facilitated by these networks. Leading from that historiography he imagines future digital objects, texts, spaces and interfaces whose aesthetics will reveal the oppressive operations of the corporate digital system that increasingly intercedes in socio-cultural relations.

He identifies a necessary reciprocity between human and technology in the emerging socio-cultural structures and art forms of the developing digital medium. For example, he identifies how the loss of social privacy with the rise of electronic surveillance technologies motivated Internet users to divulge intimate details to each other in the anonymity of their disembodiment through digital technology (*Ibid.* 19-20). Through interactions like these that begin to 'take on the lineations of the unconscious,' Cubitt says, the reciprocal operation of human and machine in the digital domain forms a 'cyborg unconscious' (*Ibid.* 60).

Despite echoing Youngblood's conceptual coextension of the noosphere and synaesthetic cinema and Holtzman's concept of the digital mosaic, Cubitt emphasises the dangers inherent in the non-egalitarian digital network that is controlled by

corporate, military and governmental interests, rather than the cultural freedoms that they describe. For Cubitt digital aesthetics is an ethical issue because the cyborg unconscious of the digital network makes corporate, military and governmental control all the more insidious.

He shares Youngblood and Holtzman's future-oriented rhetoric, finding in the digital aesthetic the 'condition of art, to indicate that which is not-yet, to embody that which is not the case,' which he sees as 'the condition of any digital practice which is dedicated to survival at the beginning of the millennium' (*Ibid.* 151). While he acknowledges the paradox inherent in the concept of a digital art form whose aesthetic value is contingent on its modelling of alternatives to the structures of domination within which it inevitably operates, he appears to be less cognisant of the contemporaneity of his future projections. As Erkki Huhtamo points out in 'From Kaleidoscomaniac to Cybernerd: Notes toward an Archaeology of the Media' (1997), media historiographies are always necessarily present interpretations of the past. Equally, the future digital aesthetics described by Youngblood, Holtzman, Binkley and Cubitt are necessarily specific to, and illustrative of, their cultural contemporaneity rather than of the future.

Rather than envisaging future digital media, in *Times of the Technoculture: Information, Communication, and the Technological Order* (1999), Robins and Webster's historiography of the interconnection of corporate, government and military interests in the development of the media, reveals how late twentieth century digital technologies continued to maintain the dominant ideologies of the capitalist system. Despite their revolutionary guise, stemming from their innovative operations and experiences, digital technologies merely contributed to the 'broadening and

accumulation' of existing economic, political and cultural agendas and perspectives (Robins & Webster 1999: 3).

They emphasise the discordance of the revolutionary capacity of digital technologies in their creation of new virtual worlds, communities and identities, and the operation of culture within those spaces, thereby highlighting the discordance of prevalent techno-utopianism and the contemporaneous operation of digital technologies. In contrast to the future-oriented rhetoric of the techno-utopians, they seek an elusive contemporaneous 'radical alternative' to the techno-cultural status quo (*Ibid.* 250).

Writing in the notional future of Cubitt's *Digital Aesthetics*, in 'Click This: From Analog Dreams to Digital Realities' (2004), Everett considers the aesthetic implications of the conservatism that Cubitt, Robins and Webster identified in 1990s digital culture. Focusing on one aspect of digital aesthetics, she highlights the 'convenient structured absence' of 'black early information technology adopters' in digital culture and discourse (Everett 2004: 93).

She identifies interactivity (or 'click fetish'[29]), mobility and instantaneity – features unique to digital technology that facilitate and enhance personal engagement with the network – as the refutation of what she terms 'digital culture's utopic concept of bodily transcendence' (*Ibid.* 94). Noting this discordance between digital operations and digital discourse, she identifies a similar discordance between the non-representation of 'Afro-geeks' – black African, British and American digital technologists, scholars, artists, musicians and activists – in the digital media arts and their instrumentality in the real world development of digital technologies, communities, practices and scholarship. Rather than aesthetically modelling

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[29] See Anna Everett, 'Digitextuality and Click Theory' (2003), pp. 14-16.

resistance to the dominant ideology as Cubitt had envisaged, Everett emphasises how their non-representation in digital media arts continued to maintain the 'forced invisibility' and corresponding 'cognitive dissonance' of the Afro-geek (*Ibid.* 95).

She concludes that the formal absence of the Afro-geek from the digital arts results in his/her absence from the 'consensual hallucination'[30] that is the space of digital culture. This maintains his/her exclusion from digital discourse and moreover, from the cultural consciousness, where 'for society at large the idea of Afro-geeks remains primarily one of cognitive dissonance—a gap'[31] (*Op. cit.*). In contrast to Cubitt's digital aesthetic of utopian realism, Everett's aesthetic of absence 'underscores the inability of new media technologies to break free of damaging ideologies and presumptions' (*Ibid.* 96), which persisted, despite Cubitt's aspirations for the future.

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[30] Here Everett invokes William Gibson's description of cyberspace in his novel *Neuromancer* (1984).
[31] Here Everett engages a similar perspective as Jacques Rancière in *The Politics of Aesthetics: the Distribution of the Sensible*, in which he comparatively analyses politics and aesthetics as they both delimit 'the visible and the invisible, the audible and the inaudible, the thinkable and the unthinkable, the possible and the impossible.' (2004: 3)

1.3   Evolutionary Digital Media – Imitative Technologies

Cubitt, Robins, Webster and Everett identify - despite the revolutionary features of digital technology – continuity between the ideologies, conventions and aesthetic strategies of analogue media and those of their digital successors. Thus, they identify the coexistence of revolutionary and evolutionary features in digital media. Evolutionary digital media discourse acknowledges and critically engages the lineage of representational, communicative and formal strategies from pre-digital to digital media arts. An early proponent was Erkki Huhtamo in 'From Kaleidoscomaniac to Cybernerd: Notes toward an Archaeology of the Media' (1997), whose media archaeological methodology was later followed by Jay David Bolter and Richard Grusin in *Remediation: Understanding New Media* (1999), and Lev Manovich in *The Language of New Media* (2001a). Michael Punt in 'Parallel Histories: Early Cinema and Digital Media' (2000), and André Gaudreault and Philippe Marion in 'The Cinema as a Model for the Genealogy of Media' (2002), propose similarly regressive methodological approaches to the study of digital arts and technologies that are informed by the development of prior media forms, particularly cinema.

In 'From Kaleidoscomaniac to Cybernerd: Notes toward an Archaeology of the Media' (1997), Erkki Huhtamo promotes his alternative to prevailing methodologies of media analysis – such as those followed by Youngblood, Holtzman, Binkley and Cubitt – that typically approached media development as a revolutionary process. The archaeological alternative that he proposes pursues instead the 'recurring cyclical phenomena that (re)appear and disappear and reappear over and over again in media history, somehow seeming to transcend specific historical contexts' (*Ibid.* 222).

Rather than theorising the interrelation of radical technological affect[32] and effect, his research contextualises recursive media phenomena in order to reveal the ways in which they are, and have historically been, embedded in the discursive traditions and formulations that establish the identity of a medium.

Huhtamo proposes a medium specific analysis of these phenomena, not in terms of their technological support, but rather, as Binkley earlier proposed, in terms of the 'cultural conventions that define what the medium is and how to experience it' (1990a: 236). Like Binkley, Huhtamo similarly identifies how 'the reality of media history lies primarily in the discourses that guide and mold its development' (1997: 222). He does not deny technological progress. Rather, his media archaeology foregrounds continuity in media phenomena – the formal features, modes of experience, and so on, that re-emerge in relation to a variety of technological supports – and counterbalances revolutionary theoretical perspectives that tend to overlook this essential aspect of media development.

In *Remediation: Understanding New Media* (1999) Bolter and Grusin adopt a similar methodology, which they term a genealogy[33] of the media, to establish the identity of new (digital) media in its process of remediation – or repurposing – aspects of earlier media. They analyse the visual commonalities between a number of exemplary media arts practices, objects, texts and interfaces using key concepts from structuralist, postmodernist and feminist theory, tracing the genealogy of their visual strategies and the visual experiences that they produce, despite being based in a variety of technologies.

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[32] I use the term *technological affect* to refer to the formal expression of technology as the necessary precursor to its specific *effect*. See also Vivian Sobchack, 'Science Fiction Film and the Technological Imagination' (2004), Norman Taylor, *Cinematic Perspectives on Digital Culture: Consorting with the Machine* (2012).
[33] A term they borrow from Michel Foucault in 'Nietzsche, Genealogy, History' (1977: 81): 'An examination of descent also *permits the discovery, under the unique aspect of a trait* or a concept, of the myriad events through which—thanks to which, against which –they were formed.'

Remediation comprises 'twin preoccupations': immediacy, the experience of 'the transparent presentation of the real' and hypermediacy, the experience of 'enjoyment of the opacity of media themselves' (Bolter & Grusin 1999: 22). Remediation involves the complex relation and interrelation of immediacy and hypermediacy: 'Transparent digital applications seek to get to the real by bravely denying the fact of mediation; digital hypermedia seek the real by multiplying mediation so as to create a feeling of fullness, a satiety of experience, which can be taken as reality' (*Ibid.* 53). Thus, the human being is central to their theory, being the subject and ultimate arbiter of the operation of remediation, which is specific to: the individual viewer's experience at the moment of reception of the media object, text or interface; their prior experience of other media forms; and their own judgement as to whether an experience is termed hypermediated or immediate.

Despite its necessarily personal operation and its basis on a dialectical operation that resists definitive conclusion,[34] their theory of remediation astutely emphasises the centrality of the human being in conceptualising processes of mediation. Rather than implementing a media effects inflected study that is characteristic of the broader field of media studies[35] – McLuhan, Youngblood, Everett, Robins and Webster's research, for example – Bolter and Grusin, like Holtzman before them, emphasise the agency of the individual within the prescribed bounds of media communications.

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[34] See Ágnes Pethő, '(Re)Mediating the Real. Paradoxes of an Intermedial Cinema of Immediacy' (2009) for a further exploration of the dialectical relationship between immediacy and hypermediacy.
[35] Media effects theory and analysis is a long-standing branch of media studies that theorises how media affect how audiences think and behave. See for example, Edward S. Herman and Noam Chomsky, *Manufacturing Consent: The Political Economy of the Mass Media* (1988). Questioning such perspectives forms an important aspect of media effects discourse, notably Stuart Hall, 'Encoding and Decoding in the Television Discourse' (1973); David Gauntlett, *Moving Experiences: Understanding Television's Influences and Effects* (1995).

In addition, Bolter and Grusin's focus on the human subject in processes of remediation highlights a fallacious assumption about the experiential aspects of digital arts that have nevertheless persisted in scholarly and vernacular discourse. Using the example of photorealistic digital images, they point out how 'the computer is imitating not an external reality but rather another medium' (*Ibid.* 28). Thus – in accordance with their concept of remediation – the viewer's responsive reception of the photorealistic digital image is not contingent on the image's fidelity to their external world, but rather on its fidelity to the representational strategies of a prior medium with which they are familiar. In his essay 'Impact Aesthetics: Back to the Future in Digital Cinema?: Millennial Fantasies' (2000), Scott McQuire made a similar point in relation to digital cinema. He points out how digital cinema does not aim to mime reality, but rather camera-reality, 'because of the extent to which audiences have internalised the camera's qualities as the hallmark of credibility' (2000: 49).

Bolter and Grusin ultimately establish that the only new aspect of new (digital) media is, paradoxically, the particular ways in which: 'each innovation rearranges and reconstitutes the meaning of earlier elements. What is new about new media is therefore also old and familiar: that they promise the new by remediating what has gone before' (1999: 270).

Manovich's media archaeology in *The Language of New Media* (2001a) defines the formal and operational specificities of digital media in relation to their historical precursors in visual culture and media practices. Using the formal arrangement of *Man with a Movie Camera*[36] (1929) by the Russian filmmaker Dziga Vertov as a conceptual model, he systemises his analysis of the language of the new

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[36] Original title: *Человек с киноаппаратом.*

(digital) media. He identifies how this language – comprising the screen, the loop, the interface, the database, compositing, and the discrete mediation of digital data underpinning the principles of modularity, automation, variability, transcoding and interactivity – remediates similar features in analogue photography, pro-cinematic media, and film. Acknowledging the limits of his methodology with regard to the programmability of digital technologies, he suggests that its analysis should belong to a separate field of scholarship – 'software studies' – thereby positioning his research at the intersection of media theory and software theory (Manovich 2001a: 48). He analyses experimental film, computer graphics and imaging, animation, video art, digital interfaces, computer games and net.art,[37] drawing on film, social, linguistic, literary and computing theory in order to posit 'general tendencies', rather than 'absolute laws', of the language of digital media (*Ibid.* 27).

Given the archaeological perspective of his project and its focus on remediation, it is surprising that he finds: '[…] regardless of how often we repeat in public that the modernist notion of medium specificity is obsolete, we do expect computer narratives to showcase new aesthetic possibilities which did not exist before digital computers. In short, we want them to be new media specific' (*Ibid.* 237). However, like Bolter and Grusin, Manovich focuses on existing representational, communicative and formal strategies that are remediated in digital media, rather than on new representational, communicative and formal strategies of digital media.

His use of the word 'language', rather than 'poetics' or 'aesthetics', signals 'the different focus' of his research that is concerned with 'the emergent conventions, the recurrent design patterns, and the key forms of new media' (*Ibid.* 12). For him that the term aesthetic implies a set of oppositions, 'between art and mass culture,

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[37] Net.art refers to the Internet-based art of a group of artists - Minerva Cuevas, Jodi (Joan Heemskerk and Dirk Paesmans), Heath Bunting, Daniel García Andújar, Rachel Baker, Alexei Shulgin, Olia Lialina and Vuk Ćosić - working in the 1990s.

between the beautiful and the ugly, between the valuable and the unimportant' that he seeks to avoid (*Loc. cit.*). Despite this early clarification, he uses the word aesthetic in a variety of ways throughout the book. At times it: denotes experiential media phenomena, where he uses the terms experiential and aesthetic interchangeably; at others, he refers to the formal features of cinema – the frame, for example – as 'aesthetic strategies' (*Ibid.* 86); and at others, he uses it to indicate the conceptual implications of form, referring, for example, to new media's 'aesthetics of continuity' (*Ibid.* 143). He later discusses the aesthetic logic of digital compositing as both a technological and conceptual operation (*Ibid.* 158). Despite his claimed aversion to the use of the term aesthetic, he nonetheless defines his project thus: 'in order to develop new aesthetics of new media we should pay as much attention to the cultural history as to the computer's new unique possibilities to generate, organize, manipulate and distribute data' (*Ibid.* 314).

Despite the criticisms Manovich's research into digital technologies drew for using a methodology of analysis rooted primarily in film,[38] Michael Punt similarly took a historical perspective in this nascent period of digital theory. Rather than the comparative analysis of film and digital media technologies that Manovich followed, in 'Parallel Histories: Early Cinema and Digital Media' (2000) Punt follows a *comparable* methodology in order to ascertain: 'to what extent might research into a nineteenth century technology such as early cinema history be valid in understanding digital technology?' (Punt 2000: 74). Critically engaging digital media through the lens of historical discourse concerning early cinema, he focuses on the social and economic processes that shape its 'dominant stylistic use', noting how 'the cinema was shaped more by its uses than by the technological features of moving pictures'

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[38] See Rosalind Krauss and George Baker's 'Introduction' in *October* (Spring, 2002); Mark B. N. Hansen, *New Philosophy for New Media* (2004), pp.33-45; Alexander R. Galloway, 'What is New Media? Ten Years after *the Language of New Media*' (2011).

(*Ibid.* 64). He proposes his methodology as an antidote to the technological determinism prevalent in contemporaneous academic and commercial discourse on digital media.

His disregard of the fundamental technological differences between cinema and digital media, leads him to speculate that they can be 'adequately mapped to each other', and that 'this new technology can replicate all other media experiences without loss, including the experience of critically engaging with media' (*Ibid.* 66). However, he deduces this potential of digital technology from a study that lacks any kind of technological focus. He admits the 'seductive parallelism' of his approach (*Loc. cit.*), but argues for its relevance because 'the morphological resemblances between early cinema and digital moving images in the public domain are so suggestive' (*Ibid.* 75). Despite claiming critical engagement with the economic, social and technological features of digital media, Punt's research is concerned only with the 'morphological', or formal, resemblances between digital media and early cinema, therefore lacking necessary evidence for many of his claims.

Presenting a similar, yet more robust, argument in 'The Cinema as a Model for the Genealogy of Media' (2002), Gaudreault and Marion account for the disparity between the revolutionary capabilities of digital technology and its conventional use, also identified by Robins, Webster and Everett. Their 'genealogy'[39] comprises revolutionary and evolutionary critical perspectives, viewing media development as a process of rupture *and* gradual morphing.

Rejecting the widely held gradual development of cinema from pro-cinematic devices,[40] they assert that the birth of cinema was a 'brusque qualitative leap', whose

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[39] As with Bolter and Grusin's use of the term, after Foucault, in which they follow 'the complex course of descent' of the development of media (1977: 81).
[40] See Tino Balio, *The American Film Industry* (1985); Paolo Cherchi Usai and Lorenzo Codelli, *Before Caligari: German Cinema, 1895-1920* (1991); Charles Musser, *The Emergence of Cinema: The*

proportions were 'nothing less than that of an epistemological break' (Gaudreault & Marion 2002: 12). Against chronophotography[41] – whose production of a series of images developed from its photographic precursor, but did not alter the phenomenal experience of those images – they contrast the cinematograph which, 'by combining numerous single images' and 'fusing these images and voiding their singularity', instituted a new media form (*Ibid.*13). A process of technological morphing produced the quantitative difference between photography and chronophotography, whereas a developmental rupture produced the cinematograph's phenomenological specificity.

They identify rupture and gradual morphing in cinema's development, with the technological irruption tempered by a slow process of maturation, through which the medium finally establishes its specificity. Despite its technological novelty, they find how cinema was initially 'used as a new way of continuing to do what had "always" been done', being a '"crypto-medium"', because its singularity, as a medium' had yet to be established (*Ibid.* 13; 15).[42] Their genealogical model traces the appearance of the irrupted technology, through its period of monstration,[43] to its ultimate constitution as an autonomous, or singular, medium. Their research crucially identifies how the singularity of a medium is contingent both on its technological base, and on 'what sort of specific or even original content will be made possible by this technology once the medium determines its first identifying marks' (*Ibid.*16).

American Screen to 1907 (1994); Richard Abel, *The Ciné Goes to Town: French Cinema 1896-1914* (1998); William Kennedy-Laurie and Antonia Dickson *History of the Kinetograph, Kinetoscope, and Kineto-phonograph* (2001).

[41] Chronophotography is a Victorian photographic technique used primarily for scientific motion studies. See the work of Étienne-Jules Marey (1830-1904) and Eadweard Muybridge (1830-1904), for example.

[42] Noël Carroll made a similar observation with regards to the emergence of photography, film and video: 'Each of these art forms appears to undergo an initial phase in which each attempts to legitimize itself as art by aping the conventions, forms and effects of pre-existing arts' (1985: 127).

[43] Monstration is the second phase of a medium's development, following the irruption of its technology, and is marked by two concurrent tendencies where the new technology is largely used to reproduce the established conventions of a prior medium, while its medium specific potential is also explored. 'This is why monstration is a major participant in what we might call the medium's emancipation, even as it anticipates the subsequent paradigm, which is founded on the notion of institutionality [*sic*]' (Gaudreault & Marion 2002: 17).

1.4   Evolutionary Digital Media – Hybridity

As Gaudreault and Marion demonstrate, the advent and subsequent monstration of a new medium involves the characteristics of the newly emerged technological support and those of existing media. Youngblood, Holtzman, Binkley and Cubitt's techno-utopian rhetoric responded to the unprecedented and revolutionary potential of digital media technologies. Their research illustrates technological irruption – the first stage of the development of the digital medium. Cubitt, Robins, Webster and Everett's research identifies an imbalance between the revolutionary potential of digital technologies and their enduring conventional cultural applications and operations, thereby illustrating Gaudreault and Marion's monstration of the medium. Indeed, Bolter, Grusin and Manovich's research also illustrates this period of medium development, albeit through different argumentative emphases. Their media archaeological studies identify how digital technologies remediate features of existing media. Emerging at the same time as those generalised studies of digital media, Yvonne Spielmann, Timothy Murray and Anna Munster's scholarship focuses on specific textual or aesthetic aspects of digital technology. These studies further substantiate the monstration of the digital medium.

In 'Expanding film into digital media' (1999a), Spielmann analyses the visual structures of 'interrelation between the old and the new,' and 'the dialectic between continuities and discontinuities' (132) in audiovisual media. Rather than reinforcing either revolutionary or evolutionary discourses, her research recognises the simultaneous multiplicity of heterogeneous audiovisual media in contemporaneous culture.

Through the concept of the intermedium, she explores the intermedia image wherein cinematic devices particular to both analogue and digital media coexist, while paradoxically maintaining their representational specificities. 'Cinematic devices' refers to the representational devices of film and video that developed according to their particular technological specificities. Positing the video image as the intermedium, or 'point of convergence' of multiple cinematic devices, she identifies a dialectical operation at 'the level of visibility', which formally articulates the coexistence of the representational devices of diverse audiovisual media technologies, rather than their linear descent (Spielmann 1999a: 133; 132).

She illustrates how the representational devices specific to film (the interval), video (electronic process) and digital media (mathematical calculation), are visually expressed within the intermedia image, their 'aesthetic dimension' reflecting the 'technical dimension' of each of these media (*Ibid.* 132). Using film, video, music and systems theory to support her analysis, she illustrates how the intermedia video image simultaneously expresses both the technological differences between film and video, and the similarities between video and the digital, 'so that we may compare structurally the form and function of temporal and spatial features as they shift when dealt with in another medium' (*Op. cit.*). The video image as intermedium in the 'shift from analogue to digital form' (*Ibid.* 144) illustrates her theory of audiovisual media development as an evolutionary rather than revolutionary process. However, this image also manifests the developmental ruptures whereby the representational devices of film, video and digital are technologically distinct.

Considering the shift from intermedia video to digital aesthetics in 'Aesthetic Features in Digital Imaging: Collage and Morph', she examines the aesthetic implications of hybridity 'when photographic, cinematic, and electronic elements are

brought together on the basis of the digitally encoded image [...] causing a shift in the nature of the image itself' (Spielmann 1999b: 131). Comparatively analysing analogue intermediality and digital hybridity, she establishes their fundamental technological differences.

The intermedia video image transforms different media types that are then transmitted on 'a third level - which is the resultant image' (*Ibid.* 135), whereas digital hybridity involves a process of simulation in which different media types are subsumed into homogeneous digital data. Rooted in this homogeneous base, the digital aesthetics of collage, the compression of linear montage through compositing, and morph - the compression of temporality – express, she argues, sameness *and* difference, because they simultaneously formally separate and technologically connect elements within a single image. Focusing on these 'spatial effects'[44] of hybridity, she shows how they maintain 'the fundamental incoherence of the elements combined' (*Ibid.* 134), while they are paradoxically based in technological sameness.[45]

Stating that these spatial effects are not possible in analogue imaging, she is not referring, in formal terms, to their visual density (which could feasibly be produced through analogue media, albeit through a significantly more labour-intensive process), but rather in conceptual terms, to their aesthetic operation. Collage and morph are digitally specific because they formally and conceptually express the instability and omnidirectionality that are unique to digital data, which, in hybrid images, nonetheless underpin elements derived from analogue technologies. She concludes: 'the paradoxical image of the digital is the place where essential characteristics of the analogue become visible as a category of the digital' (*Ibid.* 148).

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[44] She borrows this term from Seán Cubitt in *Digital Aesthetics* (1998), pp. 61-91.
[45] Here, Spielmann invokes Vivian Sobchack's concept of the sameness of difference that she expounds in 'At the Still Point of the Turning World: Meta-Morphing and Meta-Stasis' (2000).

The digital image that she describes articulates the monstration of its nascent medium, where its technological specificity articulates the characteristics of existing media.

For Murray interaction is key to digital aesthetics, which, for him, centre on the interaction of user and artwork rather than on the formal elements of the image. In 'Digital Incompossibility: Cruising The Aesthetic Haze Of The New Media' (2000), he finds the promise of digital aesthetics in its 'enhanced zone of "interactivity" through which the users' entry into the circuit of artistic presentation simulates or projects their own virtualizations, fantasies, and memories in consort with the artwork' (Murray 2000).[46] However, he finds a fundamental paradox at the heart of its 'radical potential' (*Ibid.*). Echoing Bolter, Grusin and Manovich, he finds that despite their technological capacity to integrate user and artwork in a hitherto inconceivable manner, digital artworks largely remediated the representational codes of pre-digital media, implementing categories of place, space and identity inappropriate to their technocultural context. Such works 'open themselves to the virtuality of the future only in relation to their dedicated refashioning of past codes of similitude and resemblance' (*Ibid.*).

Analysing Jean-Louis Boissier, Norie Neumark, Perry Hoberman, Miroslaw Rogala, and Reginald Woolery's artworks, he explores their use of established codes as a means of articulating the newly emerged spatio-temporal paradigms of virtuality. Drawing on Gilles Deleuze's reading of Gottfried Wilhelm Leibnitz's notion of incompossibility,[47] Murray traces how the incongruous spatio-temporalities of virtual and actual worlds become linked through technologies and practices of interactivity, where they 'stand in paradoxical relation to one another as divergent and coexistent: as "incompossible"' (*Ibid.*). He finds how, despite their distinctly digital context of

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[46] As this journal article is an e-publication (ctheory.net), there are no page numbers available for citation. This applies also for Munster (2001), an e-publication from the same website.
[47] Gilles Deleuze, *Logique du sens* (1969), pp. 138-139.

production, 'the metaphors and architectonics of resemblance, identity, point of view, and societal place' that have traditionally informed cultural perception, 'continue to haunt and inform even the most utopian projects of virtual interactivity' (*Ibid.*). Murray, therefore, identifies another aspect of the monstration of the digital medium, wherein its technological potential is circumscribed by the enduring codes of pre-digital media.

In 'Digitality[48]: Approximate Aesthetics' (2001), Munster establishes a conceptual nuance of the interactive process, the notion of proximity, in order to define the aesthetic operation of digital technologies. At the outset, she posits the non-aesthetic nature of any experience considered purely in technological terms, arguing that any analysis of art centred solely on such processes, whose parameters are therefore preordained, precludes 'the aesthetic moment as sensate experience of that art' (Munster 2001). Despite her critical focus on 'the content and ideas expressed through digital art' rather than on the technology that facilitates their expression, she paradoxically suggests that 'there is increasingly a sense in which it is possible to aesthetically locate the digital' (*Ibid.*). Consequently, she roots the digital aesthetic in the 'relations of proximity' that are facilitated by its technologies: the formal interaction of digital and pre-digital media (Spielmann's hybridity), the interaction of divergent spatio-temporal structures, and of the organic body and these structures in virtual space (Murray's incompossibility).

She states that 'aesthetic interaction with digital art may simultaneously require systemic disconnection' (*Ibid.*), suggesting a distinction between digital aesthetics and their facilitating technology, while simultaneously acknowledging the crucial role of digital technology in framing digital aesthetic experiences.

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[48] Using the term *digitality*, Munster invokes Nicholas Negroponte's concept of the condition of living amongst and through digital technologies that defines digital culture, expounded in his book *Being Digital* (1995).

Accordingly, she argues that digital aesthetics 'are not reducible to a set of technical parameters nor can the digital be considered solely in terms of the formal qualities and conditions it imposes on its products or outcomes' (*Ibid.*). Describing an aspect of the monstration of the digital medium, in which the approximative relations introduced by digital technologies to millennial cultural experiences facilitated the intersection of pre-digital and digital forms, Munster also outlines the essential properties of an autonomous medium as the intersection of its technological, aesthetic and experiential specificities.

1.5   The Question of the Medium

The fundamental virtuality and variability of digital technologies, which for Binkley, Youngblood, Holtzman and Cubitt signalled a radical change in the history of media arts, obliterated the traditional notion of the medium as a tangible and delimited material technological support of a particular arts practice.   Each of the studies discussed in this chapter makes reference to the medium as the subject of their research, whether understood in terms of the digital technological support of creative and social practices, the communication channel within which these practices operate, the cultural conventions that shape these communication processes, or, a combination of more than one of these features.

These various projects of research that sought to establish: the emancipatory creative potential of digital media; the critical distinction between that potential and its conventional application; the proclivity of these technologies to reproduce pre-existing aesthetic experiences; or to combine pre-existing and innovative aesthetic experiences, complicate the concept of the medium and its specificity.   If digital technologies can do all of these things, then how can we define the concept of the medium that permeates this field of scholarship?   Each of the preceding studies attempted to establish the digital medium according to various critical perspectives. The following studies by Binkley, Mark B.N. Hansen, Steven Maras and David Sutton, Manovich and Matthew Fuller offer more comprehensive critical perspectives on the concept of the digital medium.

Binkley recognised the early stages of the destabilisation of the concept of the medium in the ready-made, multi-media and performance art of the 1970s that undermined the concept that was 'invented by aesthetics in order to explain the

identity of artworks which articulate with aesthetic qualities' (1977: 272).[49] Later, in 'Digital Dilemmas' (1990b) he comparatively analyses a photograph of a computer-generated image of Louis Di Gena's *Time* (1989) and a lithograph of the same image, to illustrate the cultural implications of the introduction of digital technology to arts practice. One of these was the destabilisation of established theories – such as that of the medium – which were fundamental to the study of art. Showing how 'the computer ultimately challenges many of the neat distinctions we have accrued over the course of centuries of living without these paradoxically intelligent machines' (Binkley 1990b: 19), he attempts to define the limits of the digital image using mathematical theory[50] combined with theories of hardware and software systems design.

He identifies how the fundamental variability of the digital image, being simultaneously both an image and an array of numbers, depending on its facet viewed, expands the conceptual limits of the image. Consequently, he suggests that 'Instead of isolating our attention on the "digital image", it is imperative to examine how its complete environment functions' (*Ibid.*18), thereby identifying the medium of the digital image in its inextricable relation to its cultural and technological context. He ultimately defines an aesthetics of the digital image, which comprises the perception of an image and an awareness of its technocultural significance. As a result, he asserts that the '"what' and 'how' of virtual creation are intimately linked through the formal mathematical structures that define them both', thereby 'subverting our customary identification of images with media' (*Ibid.*18; 14).

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[49] Nicholas Bourriaud later develops his aesthetic theory in respect of similarly non-mediated, what he terms *relational*, art of the 1990s in his book *Relational Aesthetics* (1998).
[50] In particular Russell's paradox, a paradox in Georg Cantor's set theory discovered by Bertrand Russell in 1901 and published in his book *Principles of Mathematics* (1903).

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Hansen later echoes this point in *New Philosophy for New Media* (2004), advising that the notion of 'the image can no longer be restricted to the level of surface appearance, but must be extended to encompass the entire process by which information is made perceivable through embodied experience' (2004: 10). Attending to the consequences of digital technology for concepts fundamental to the study of the arts, he states that 'with the flexibility brought by digitization, *there occurs a displacement of the framing function of medial interfaces back onto the body from which they themselves originally sprang.* It is this displacement that makes new media art "new"' (*Ibid.* 21). His research reassesses the system of principles according to which art has historically been critically engaged and evaluated, theorising the implications of digital technology for the hitherto largely stable category of the medium. His concept of the medium spans a technologically circumscribed relationship between artwork and viewer, through which the viewer subjectively frames virtual digital processes that lack, by definition, a material substance.

Maras and Sutton explored the changing concept of the medium in their critical genealogy of medium specificity, 'Medium Specificity Re-visited' (2000). Showing how Gotthold Ephraim Lessing's concept of the medium in his *Laocoön: An Essay upon the Limits of Painting and Poetry* (1766)[51] – the means to differentiate arts 'on the basis of their means of imitation' (Maras & Sutton 2000: 98) – had remained largely unchanged until twentieth century film studies, they adopt this theoretical perspective as the first stage in establishing medium specificity. Exploiting Noël Carroll[52] and Bolter and Grusin's[53] theories on film, electronic and

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[51] Available in translation since 1874, see bibliography.
[52] See Noël Carroll, 'Medium Specificity Arguments and Self-Consciously Invented Arts Film, Video and Photography' (1985); *Philosophical Problems of Classical Film Theory* (1988).
[53] In *Remediation: Understanding New Media* (1999).

digital media, which treat of the developmental overlap between existing and emerging media art forms, they describe how this overlap occurs in the development of the medium from its analogue instantiation as 'an articulated materiality, with an associated material value', to its virtuality in digital technology (*Ibid.* 104). Consequently, they assert that 'no medium exists in a final form' (*Ibid*).

In their attempt to define the medium they invoke Gilles Deleuze and Félix Guattari's concept of the emergent form of the rhizome,[54] in order to 'preserve a central insight of medium specificity claims – that there are identifiable differences between one medium and another – while refusing any notion of medium purity' (*Ibid.* 103). Their refutation of medium purity enables them to argue, like Binkley and Hansen, that the term medium does not refer exclusively to a particular technological support, but rather comprises the 'particular formations, apparatuses, and assemblages' (*Ibid.* 109) that coalesce in its establishment, to use Gaudreault and Marion's terminology.

In 'Post-Media Aesthetics' Manovich similarly seeks an alternative methodology to the 'centuries-old typology of mediums' (2001b: 1) made irrelevant by the advent of virtual digital technology. His 'post-media aesthetics' substitutes the concept of medium with 'new concepts from computer and net culture' as an alternative critical paradigm for the digital arts (*Ibid.* 5). His concept of post-media aesthetics extends the genealogy of cultural theory, advancing from a conceptual focus on the author (traditional criticism), to a focus on the text (structuralism), to a focus on the reader/viewer (psychoanalysis, ethnography), to a focus on the cultural software underpinning all digital arts practices.

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[54] See Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (1988).

For Manovich, cultural software mediates the artist's expression and the information behaviour of the user. The term thus refers, like Maras and Sutton's concept of the medium, to the forms, practices, and principles that centre on a facilitating technology, rather than simply to the technology itself. Critically engaging the cultural software of the current period therefore reveals how 'the history of art is not only about the stylistic innovation, the struggle to represent reality, human fate, the relationship between society and the individual, and so on – it is also *the history of new information interfaces developed by artists, and the new information behaviors developed by users*' (*Ibid.* 9). Hence, as Binkley and Hansen also suggested, the critical analysis of digital art should centre on its technologically enabled complex integration of human and computer, technology and art, and artist and audience.

Fuller similarly engages the concept of the medium in *Media Ecologies: Materialist Energies in Art and Technoculture* (2005), interpreting it as a non-hierarchical, heterogeneous and complex interconnection, after Deleuze and Guattari's rhizome.[55] He uses this concept to explore the ecology of global media, understood as a rhizomatic organisation of analogue and digital media systems that interact, merge and counter each other within the overarching system. He charts certain dimensions or 'directions in motion' (Deleuze & Guattari 1988: 23) of the media rhizome that illustrate, through their poiesis, the patterns, potentials, and dangers of the media.

His media ecology[56] differs from prior, largely technological determinist approaches,[57] which typically centred on the idea of media as materially delimited

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[55] *A Thousand Plateaus: Capitalism and Schizophrenia* (1988).
[56] See also Félix Guattari, *The Three Ecologies* (1989).
[57] See Lewis Mumford, *Technics and Civilization* (1934); Neil Postman, 'The Reformed English Curriculum' (1970); Raymond Arlo, 'Media Ecology' (1971); James J. Gibson, *The Ecological*

facets of an overarching network whose specificities determine how we communicate, think and see ourselves.[58] Charting various 'medial components' (Fuller 2005: 7) of the rhizome that comprise radio, photography, the web and surveillance, he instead explores their dynamic and recursive interrelation of people, objects, technological processes, experiences and forms. Using philosophical, media and critical theory to support his analysis, Fuller constructs a conceptual alternative to technological determinist methodologies, treating media as 'dimensions of relationality' that can be variously interpreted as political, economic, rhythmic, aesthetic, and so on 'according to the instruments used to interpret them' (*Ibid.* 175).

Approach to Visual Perception (1986); Marshall McLuhan, *Understanding Media: the Extensions of Man* (2001); Lance Strate, 'A Media Ecology Review' (2004); Vito Campanelli, *Web Aesthetics* (2010).
[58] Such a methodological approach to media studies is later critiqued by Palo Fabuš in 'The World Engulfed by Technology: A Critique of New Media' (2009).

1.6   Medium Specificity – Digital Aesthetics

In response to the cultural development of the medium and its corresponding critical reinterpretation in largely holistic studies, subsequent digital arts scholarship began to focus on individual aesthetic features of these arts. Frank Popper, Jamie O'Neil and Rosa Menkman critically analyse the aesthetic specificities of virtuality and interactivity, remix, and glitch, respectively, and in so doing, define aspects of the early stirrings of the constitution of the digital medium.

In *From Technological to Virtual Art* (2007), Popper explores the technological specificities of virtuality and interactivity that define the aesthetics of digital art. As he earlier explained:

> One of the main reasons for my interest early on in the art and technology relationship was that during my studies of movement and light in art I was struck by the technical components in this art. Contrary to most, if not all, specialists in the field who put the stress on purely plastic issues and in the first place on the constructivist tradition, I was convinced that the technical and technological elements played a decisive part in this art.
> (Nechvatal 2004: 63)

His historiography of the development of digital arts from analogue arts of the twentieth century illustrates how they diverge sharply from them, identifying virtual art's 'humanization of technology,[59] its emphasis on interactivity, its philosophical attitude toward the real and the virtual, and its multisensorial outlook', as digitally specific features (Popper 2007: 1).

He distinguishes virtual art practices from traditional art practices by way of virtual artists' commitment to aesthetics and technology, finding that this 'techno-aesthetic creative commitment' which appears to be 'of a scientific or social order,' is

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[59] A concept that originated in Frank Popper's *Art of the Electronic Age* (1993).

'in fact also concerned with basic human needs and drives' (*Op. cit.*). Analysing a wide range of digital arts practices – off-line materialised multimedia and digital works, interactive digital installations and online works – he identifies a common techno-aesthetic that explores the integration of human perception with the operations of digital technology. He also identifies a fundamental openness to virtual art, both from the point of view of the technological expansion of the creativity of the artists that he interviews, and from the point of view of the technologically enabled immersion and/or physical interaction of the audience/users with such art. For Popper, this recursive and productive relationship between technology, art and audience is specific to the digital arts.

In 'The Remix Aesthetic: Originality Mixed and Mashed-up' (2006), O'Neil engages a similar theoretical perspective in order to explore remix, the creation of a new text using existing media texts and objects, which establishes a discursive tension between the original context of the remediated content and its new digital context. As he explains: 'The Remixer does not consider "media" as merely a recorder of "meaning", but rather as an interface into which we continually re-interpret, re-record, and re-invent meaning. The remix aesthetic processualizes media and thus opens "recordings" to the future, yet this is accomplished through a very different approach to the "original" or historical' (2006: 23). Like Munster, Binkley, Hansen, Maras, Sutton, Manovich and Fuller, O'Neil similarly rejects the limited view of the medium as a material substance, seeing it instead as the interface of the operation of digital culture.

He acknowledges its technological base as 'the movement of *bits*, a mutable entity' (*Ibid.* 24), but as his analysis of remix emphasises, the media texts and objects that circulate within digital culture are no longer dependent upon, or defined by, any

one particular technology. Remix de-historicises media content from its original technological context and repositions that content in a contemporary text, making explicit its process of remediation and correspondingly, the historic nature of the remediated content. Remix 'valorizes the opposite, it is media in metamorphosis; it becomes original by beginning with a recognition of the impossibility of originality and survives only, by identifying itself with it's [*sic*] temporal (i.e. living) manifestations' (*Ibid.* 25). Thus, he identifies a fundamental paradox: remix as a distinctly digital practice whose realisation depends on the mutability of digital data, but equally depends on pre-existing, historic media.

O'Neil's critical analysis of remix as a distinctly digital practice emphasises the specificity of his discussion of remix to a particular technocultural phenomenon, which is particular to a specific cultural period - contemporary digital culture. Of course, there are many variations of remix practices that can be found throughout analogue media arts practices, in vinyl DJing,[60] collage[61] or other found footage[62] film practices, for example. While there are definite similarities amongst the formal effects of remix practices - which in general terms, could be described as the juxtaposition of discrete media elements - what is central to scholarly analyses of remix, such as O'Neil and Navas' research,[63] is the potential for critical discourse that remix practices make available to scholarly research. This is highlighted by O'Neil's description of media in remix practices as interfaces into which meaning is continually re-interpreted, re-recorded, and re-invented. While this description could potentially be applied to all remix practices, the processes of reinterpretation and

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[60] DJing is the live playing and mixing of vinyl records, which initially emerged in hip-hop culture.
[61] Collage film is a style of film production that juxtaposes elements derived from found - or pre-existing - film footage, from a number of sources.
[62] The term 'found footage' refers to pre-existing film footage that is appropriated and reused in a wide range of audiovisual practices such as video remix, collage films, etc.
[63] See bibliography.

reinvention on which his analysis of digital remix turns are specific to its digital-ness. In other words, his analysis reveals how the conceptual implications of the digital remix are informed by the cultural and conceptual specificities of its facilitating technology, which have emerged from contemporary digital culture. Accordingly, his methodological perspective of critical engagement tackles the conceptual, cultural, political and social specificities of remix specifically in terms of its contemporaneous, digital incarnation. What is key to his discussion and contemporary perspective on the remix is its foundation in 'mutable bits', whose digital specificity introduces new issues such as impermanence, variability and virtuality to the subject of analysis.

Taking as its starting point the somewhat - given its emergence in the pre-digital history of creative practices - familiar formal style of the juxtaposition or collage of media elements that largely defines remix, whether aurally or visually constructed, O'Neil's analysis of digital remix practices considers the technocultural specificities of the digital technologies that underpin the remixes that he studies. In a similar vein, the following analysis of online remix videos takes into account the specificities of the digital technologies that underpin, and therefore, facilitate these remix practices. Importantly, it also and necessarily, takes into account the technocultural specificities of these technologies that also underpin, and therefore, facilitate the operation of contemporary digital culture. While there are unmistakeable formal similarities between video remix and surrealist collage films of the 1930s (Joseph Cornell's *East of Borneo* (1931), for example), found footage films of the 1960s (Arthur Lipsett's *Very Nice, Very Nice* (1961) or *21-87* (1963), for example) and hip-hop remix practices that emerged in the 1980s (Afrika Bambaataa's *Zulu Nation Throwdown* (1980), for example), the differences between such practices

become evident when they are considered in relation to their creative, cultural and conceptual contexts of production.

Menkman also attends to a distinctly digital practice in her essay 'The use of Artifacts as Critical Media Aesthetics' (2009), in which she focuses on the glitch, the phenomenal manifestation of technological error, as a key feature of the digital arts.[64] As a foil to O'Neil's study, which emphasised the mutability of digital data and the corresponding ephemerality of digital media, Menkman's analysis argues for the materiality of digital media made manifest through glitch. Glitch makes the operation of digital technology perceptible through its formal manifestation of its means of mediation. For example, in digital processes such as lossy data compression,[65] the compression of an image can result in visible pixellation, or compression artefacts. Glitch reveals the operational processes of the digital, or its material. She elaborates: 'While the camera and the celluloid defined the film in cinema, technologies like codecs and compression artifacts will define the material of the digital work' (Menkman 2009: 3).

She goes on to describe these artefacts as medium specific aesthetics, but it is important to clarify her theoretical position: she does not mean that the glitch is specific to a single technology or technological process, rather, it is specific to the particular technology within which it emerges. She identifies the dominant ideology of the seamless and error-free operation of digital technology as fundamental to the conceptual and discursive significance of the glitch, which subverts its conventional operation. The utopian rhetoric, or 'technoromanticism' – to use Richard Coyne's

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[64] Menkman further developed these ideas in her monograph, *Network Notebooks 04: The Glitch Moment(um)* (2011).
[65] Lossy data compression is a means of reducing the file size of a media object by discarding some of its data in order to accommodate the bit rate of the desired media-streaming platform.

terminology[66] – of early digital theory nurtured this ideological perspective on digital technologies, preparing the ground for the operation of the glitch as a critical media aesthetic. Glitches formally and conceptually subvert that ideology, occupying 'the border of sense and nonsense, break and 'natural' flow, convention and the collapse thereof' (*Ibid.* 4).

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[66] See Richard Coyne, *Technoromanticism: Digital Narrative, Holism, and the Romance of the Real* (1999).

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1.7   Questions of Aesthetics

As has become evident in the preceding review of the field of digital media arts scholarship, the term 'aesthetics' pervades the discussion. However, as the review has also revealed, the interpretation of the concept of aesthetics varies widely even within this specific field of media studies.

For example, the preceding review of Manovich's *Language of New Media* revealed a number of contradictions between his stated interpretation of the term and the many and varied occasions on which he refers to or employs the term throughout his study. The purpose of this was not to criticise Manovich's critical process, rather his work provides a useful example that enables us to identify the difficulties in using such a term, whose conceptual bounds have been and remain problematic.

Those difficulties emerged in classic sources on the philosophy of aesthetics. It is rooted in ancient Greek culture, with contributions made to an apparently extant debate by Plato (in his *Republic*) and Aristotle (in his *Poetics*) - the former considering the arts generally, with regard to their value within the systems of culture, the latter with regard to the specific principles whereby works of art could be defined and appraised. Alexander Gottlieb Baumgarten introduced the term aesthetic in his *Philosophical meditations pertaining to some matters concerning poetry* (1735), and later elaborated upon it in *Aesthetica* (1750): 'Aesthetics (theory of the liberal arts, inferior cognition, art of beautiful thinking, art of reasoning by analogy) is the *science of sensitive cognition*' (1988: §1). The notion of beauty is central to David Hume's *Of the Standard of Taste* (1757), which reasons that because people have divergent sentiments on whether something is beautiful or not, standards for the judgement of taste (aesthetics) must therefore exist. Unlike Hume, Immanuel Kant in his *Critique of Judgement* (1790) did not envision an ideal critic whose discerning aesthetic

experience sets the standards of taste. Instead, he argued for disinterestedness as a prerequisite of aesthetic experience, which enabled him to establish his universal principles and generalisable scientific method of aesthetics.

Centring on the same philosophical themes, more recent uses of the concept of aesthetics in digital media arts scholarship reveal its enduring conceptual unwieldiness. For example, for Cubitt, Virilio and Everett, aesthetics are an overarching political concern, as they are for Jacques Rancière – wherein only that which can be publicly seen and heard can form part of the operation of politics and political debate. For Munster and Murray 'digital aesthetics' describes the distinct processes of engagement with the cultural objects and spaces of the virtual realm that have been made possible by digital interactivity. For Campanelli 'web aesthetics' refers to the moulding of culture and society by the digital technologies that underpin, and thereby mediate, contemporary culture. For Menkman, O'Neil and Moradi the term denotes a cohesive concept that encompasses the expressive, conceptual and cultural aspects of particular formal features in digital creative practice.

As is already clear, any attempt to critically define such an enduring concept in the study of art, and of its practices and reception, would necessitate a full-scale project of research of its own. Though beyond the scope of this study, the many facets of aesthetic methodology that were of concern in the early period of aesthetic philosophy, and endure in the contemporary period of digital media arts research, nonetheless inform the current study's analytical process. While eschewing the use of such a problematic term as aesthetics (apart from in reference to scholarship), it nonetheless engages the conceptual implications of the innovative formal features of digital technologies in online video, which draw the social, cultural and political ramifications of our engagement with digital technologies into their narratives.

Conclusion

Over the past four decades, digital media arts scholarship has responded to the development of digital media technologies, and their increasing cultural significance. This period has seen digital art mature from an essentially underground practice carried out by an initiated few, and accessed through exclusive physical and virtual networks that operated outside of mainstream popular culture, to a significantly more democratic and popular practice, in terms of its means of production, distribution and access, whose technologies, platforms and networks have since assumed a central role in contemporary culture.

The genealogy of digital media arts that the literature documents describes their growth from an obscure to a rather more dominant cultural presence. The irruption of digital technology was met by the utopian rhetoric of early digital media theorists who envisaged the future of its unmatched potential for creative expression and an emerging digital culture. Subsequent studies identified and analysed various stages and aspects of the digital medium's monstration, in which digital technology was largely used to remediate the forms, aesthetics, and sometimes, entire texts of past media. These studies typically relied on models and theoretical perspectives that had been established in response to earlier media, whose conceptual inadequacies were bolstered by mathematical and computing theory. The early period of the digital medium's monstration revealed a discrepancy between the revolutionary capabilities of digital technology and its conventional operations, the latter period was defined by its hybridity of old and new media. Studies concerned with digital specificity, in glitch and remix techno-aesthetics, for example, identified the early stirrings of institution of the digital medium.

Each of the studies discussed in this chapter account for various preliminary and intermediary stages in the process of the development of digital technology into a medium, chiefly through close critical analyses of exemplary media texts, objects, interfaces and platforms. As Gaudreault and Marion's genealogy of media has indicated, the irruption of a new technology and the subsequent period of its monstration precede its constitution as a medium. To this I would also add a similar process of development of its cultural environment and indeed, of the concepts and theoretical methodologies with which to critically engage digital arts practices.

In 2005, Geert Lovink's critique of digital art 'New Media, Art and Science: Explorations beyond the Official Discourse', describes the insularity of digital arts practices constrained by a lack of institutional structure, necessary for the support and propagation of a new art form beyond the new media festival circuit. He bemoans contemporaneous digital artworks that are bereft of a 'rich reference system or common language' and lack 'critical content and decent aesthetics,' being produced by an 'in-crowd of "net artists"' he accuses of 'hanging out in the networks and not being confronted with the world' (Lovink 2005: 92-94). His view is perhaps germane to the period of digital arts in which he wrote, prefiguring the burgeoning of the Internet and in particular, of video-streaming sites such as *Vimeo* (founded in 2004) and *YouTube* (founded in 2005). The radical transformation of digital culture in the nine years since Lovink's essay has seen the cloistered networks that he describes virtually supplant the lived world, intervening in our cultural, economic, social and educational engagements.

In 2006, Bruce Wands similarly appraised the contemporaneous digital arts, proposing a critical response that might be appropriate to their future development:

> The current tendency to categorize digital art according to established perspectives will hopefully dissipate enough to allow a deeper understanding

of its techniques and purposes to be reached. As digital art continues to take a prominent place in the contemporary art world, and the language and syntax of computer technologies become more refined and familiar, we will be better equipped to define its many forms and cultural contributions.
(Wands 2006: 14)

This research project fulfils Wands's aspiration for the future of digital arts criticism and addresses the kind of digital arts practice that Lovink could only imagine. It critically analyses a burgeoning contemporary digital arts practice in order to establish the constitution of the digital medium. Using the operational specificities of digital technology that have been identified in the scholarship – Wands's 'language and syntax of computer technologies' – as the taxonomy of the tools of research, the following study addresses the 'critical content and decent aesthetics' that Lovink found lacking in the digital arts of 2005, contextualised within the 'rich reference system' and 'common language' of contemporary digital culture.

The methodological approach of the project eschews inappropriate historical perspectives of media arts criticism, using instead, as Wands had hoped, the features, operations and concepts specific to digital technology and culture as a means to critically engage the constitution of the digital medium. That constitution, as Gaudreault and Marion's model shows, is contingent on its formal expression of these technological and cultural specificities. The following chapter elaborates the research methodology that underpins the analysis of digital arts in subsequent chapters that seeks to establish the constitution of the digital audiovisual medium.

Chapter 2:   Technocultural Articulation of the Medium

The possibility of autonomy is connected to the evolution and potential of the medium. Its second birth, or constitution, will appear when its quest for identity and autonomy coincides with institutional recognition and a decisive improvement in the economic resources devoted to its production.

André Gaudreault and Philippe Marion
The Cinema as a Model for the Genealogy of Media (2002)

Viewing digital media arts scholarship in light of Gaudreault and Marion's genealogical model of media, we can appreciate how it has traced the early to middle stages of the development of digital technology – from its irruption to proto-medium stage. This begs the question: in contemporary digital culture can we now account for the autonomous digital medium?

Gaudreault and Marion offer their model as a prototype for the analysis of media other than cinema. Briefly considering digital media, they note that:

> The label "new media" has [thus] become disengaged from or is perhaps even out of sync with new production practices, which should work in concert with the potential of the new medium. In such cases, the concept of "medium" is reduced to a mere quality as "technological novelty", without any understanding of what sort of specific or even original content will be made possible by this technology once the medium determines its first identifying marks. (Gaudreault & Marion 2002: 16)

Their model is rooted in the idea that a medium develops from, rather than is equivalent to, a technology. In light of the preceding literature review, and of the pervasiveness of digital technology throughout contemporary culture, I am inclined to agree with this idea. For example, mobile apps,[67] computer games and websites are all fundamentally rooted in the same digital technology – binary digital data comprising sequences of ones and zeros.[68] However, because they have each developed an individual instance of digital technology based on that data, instances

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[67] A mobile app, or mobile application, is a digital software application designed to run on smartphones, tablet computers, or other mobile devices.
[68] For an explanation of how digital media are distinguished from analogue media through their basis in digital data, see the Appendix to the thesis.

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whose specific functionality, and the means through which the user engages that functionality, shapes their perceptible presence in the world, they are generally understood and discussed as distinct types of digital media. A medium, therefore, is technoculturally, rather than simply technologically, defined.

Critical interpretations of culture in national, regional or generational terms typically centre on the distinctive ideas, customs, social behaviour, products, or way of life of a particular nation, society, people, or period. The technocultural definition of the medium refers to the distinctive ideas, customs, social behaviour, products, or way of life that have emerged in relation to the pervasiveness of digital technology in contemporary life. Digital technologies have obliterated the physical distances between people according to which nations and societies have hitherto been largely defined. In light of the comprehensive impact of digital technologies throughout socio-cultural practices, the current cultural period is termed as *digital culture.*

Gaudreault and Marion implement a technocultural definition of a medium, describing it as 'a relatively specific semiotic configuration supported by a technology of communication, in relation to social and institutional practices of producing and appropriating public messages' (2002: 15). Their perspective is particularly relevant with regard to digital technology, given its adaptability – digital data can *be* anything, and its ubiquity – digital data can *be* anywhere.

While it asserts a technocultural – rather than a technological – definition of a medium, Gaudreault and Marion's model, nonetheless, operates within a technologically defined conceptual space. In other words, while their model describes the cinematic medium as more than simply the celluloid, the film camera, the projector and the cinema, these technologies, in turn, define both the material, and the conceptual, space of the cinematic medium. The considerable virtual scope of digital

technology throughout contemporary culture significantly expands the concept of the medium, which was more clearly materially delimited for Gaudreault and Marion.

In an interview, Cubitt reconsidered his attempt to define *a* digital aesthetic in *Digital Aesthetics* (1998):

> I wrote *Digital Aesthetics* between 94 and 97. Even then it was pretty clear that there was something wrong about writing on the digital as if there were only one aesthetic involved. The kinds of software critique that Matt Fuller, Anna Munster, Greg Elmer and others have developed is clear indication that there is (no longer?) a singular digital aesthetic but many. (Mills 2004)

Given the extensive scope of digital technology in contemporary culture, we can draw similar conclusions about an attempt to define *a* digital medium. In light also of the potentially limitless adaptability of digital technology, it is necessary to refine the central research question in order to look for *a* manifestation of the digital medium within the extensive field of digital arts practices. Through the lens of Gaudreault and Marion's model, I look to the contemporary digital media arts in order to identify an innovative area of the digital arts that shows potential for research into medium identity, and to the field of digital media arts scholarship in order to establish selection and analytical criteria suitable for the research.

2.1   Contemporary Digital Media Arts and Scholarship

Digital media scholarship has largely generally defined, or examined particular aspects of, *either* online space *or* the digital media arts.   While some major contributions to the field of scholarship have considered online space and the digital media arts as individual aspects of a larger field of digitality (Holtzman 1994; 1998, Manovich 2001), or the digital mosaic, to use Holtzman's analogy, their convergence remains under-theorised.

This discrepancy in current scholarship is especially remiss in light of the burgeoning of online video, a digital arts practice that is specific to the virtual realm of online space. For example, in the USA, 182.5 million people watched 39.3 billion online content videos in March 2013,[69] and online video now accounts for 50% of all mobile traffic and up to 69% of traffic on certain networks.[70] Globally, online video traffic is set to be 55% of all consumer Internet traffic in 2016.[71] In addition, as the latest figures from *YouTube* show, more than 1 billion unique users visit the site each month, spending more than 4 billion hours watching videos, and 100 hours of video are uploaded to YouTube every minute.[72] Given the centrality of online video in contemporary digital arts and culture, its absence, until now, from digital media arts scholarship reflects a lack of critical awareness of online video, which is inappropriate to the current period.

As briefly mentioned in the introduction to this thesis, online video genres such as viral video, vidding and machinima have been recently studied from a social scientific point of view. This branch of scholarship has engaged online video from a *humanist* perspective: critically analysing vidding from the point of view of its

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[69] Data retrieved from: 'Digital Analytix', available from www.*comscore.com*.
[70] Data retrieved from: 'Mobile Analytics Report – June 2013', available from www.bytemobile.com.
[71] Data retrieved from: 'Cisco Visual Networking Index: Forecast and Methodology, 2012–2017', available from www.cisco.com.
[72] Data retrieved from: 'YouTube – Statistics – Viewership', available from www.youtube.com.

practitioner, using feminist or postcolonial theory, for example; critically analysing machinima from the point of view of its practice, using games or fan theory, for example; or, critically analysing viral video from the point of view of its audience, using media effects or marketing theory, for example. These humanist cultural studies are an invaluable source of knowledge on the implications of digital technology for *human identity* in contemporary culture, through their analysis of the practice and consumption of online video.

As a counterpoint to existing social scientific research into online video, the media studies approach of the current research project generates knowledge on the implications of digital technology for *medium identity* in contemporary culture, as evinced by online video. This study, therefore, operates in a conceptual realm cognate with that of existing social scientific studies of online video, encompassing the recursive relationship between human and technology that defines contemporary digital culture. It complements those studies that have illuminated the human dimension of this relationship, by illuminating its technological counterpart. In order to pursue this project of research, I have refined the central research question thus:

> Whether and to what extent does online video articulate the autonomy of the digital audiovisual medium?

This refined question enables me to pursue a focused project of empirical research into online video in order to find exemplary videos that articulate their digital specificity, rather than mimic other media. I critically analyse these videos in order to consider the complex concept of the medium in digital culture. Gaudreault and Marion's model of the genealogy of media usefully serves as the guiding theoretical framework of the project, providing valuable criteria of medium autonomy that I reformulate in this chapter in light of the current object of study. The reformulated

criteria serve as the selection criteria governing my empirical research into online video, and as the basis of the methodological design according to which I critically analyse the videos chosen.

2.2   Gaudreault and Marion's Model of the Genealogy of Media

The key criteria of medium autonomy that Gaudreault and Marion outline in their model are:

- its relationship to an institution,

- its means of transmission and the technological possibilities of this means, the ways it is disseminated,

- its semiotic configuration,

- the communicative and relational devices that are put in place or induced, etc. (2002: 15)

Using these criteria, Gaudreault and Marion codify a technocultural theoretical model of medium identity and a corresponding technocultural methodology for its analysis. The preceding review of the literature identified similar theoretical and methodological approaches to medium identity throughout the field of digital media arts scholarship.

For example, even in the early stages of the development of this field, Binkley's research delineated a similar conceptual realm to that which Gaudreault and Marion's model would later describe. Because of the fundamental virtuality of digital data, the medium in the digital domain could no longer be directly allied with a material substance. Thus, Binkley's scholarship attempted to define the digital medium, not simply in technological terms, but as 'a culturally determined channel of communication' (1990a: 236). Following this, he later asserted that '[I]nstead of isolating our attention on the "digital image", it is imperative to examine how its complete environment functions' (Binkley 1990b: 18).

Similarly, Erkki Huhtamo's media archaeology establishes a medium through the discourses guiding and moulding the cultural development of a particular

technology, where: 'The aim of the media archaeological approach is not to negate the "reality" of technological development, but rather to balance it by placing it within a wider and more multifaceted social and cultural frame of reference' (1997: 223).

In the same period, Holtzman, describes his digital worlds – of which the Internet is one – as media for human expression (1998: 15), thereby interpreting a medium as the expressive qualities produced using digital technology, which emerge from the cultural application of, and our interaction with, these technologies in digital space.

Later, in 'Post-Media Aesthetics' Manovich suggests that what we call the medium in the digital age should more accurately be reconceptualised as 'cultural software,' thereby hypothesising the digital medium as the interface of the operational specificities of digital technology, the cultural uses that they underpin, and our experiences of cultural engagement through, and with, these technologies (2001b: 9).

Later still, Fuller's media ecology in *Media Ecologies: Materialist Energies in Art and Technoculture* traces various 'medial components' (Fuller 2005: 7) that constituted the media environment of the period. These medial components are based around a facilitating technology, but comprise the recursive interrelation of human experiences, objects, technological processes and forms that such a technology founds.

More recently Karen Cham's study of aesthetics and interactive art has identified how, in digital culture, 'the medium is no longer a quality of the object. There is no object, no original, no presence in space or time, only mediation' (Cham 2009: 19).

This brief sample of critical attitudes to medium identity reveals a methodological tendency within digital media arts scholarship to approach medium

identity using terms that correspond to Gaudreault and Marion's proposed model. Speaking of their model, they assert:

> For us, cinema is not a fixed model, a sort of mathematical invariant that all new media would submissively repeat, but rather a prototype. In fact, the prototype provided by the newly emergent cinema makes it possible to carry out precise analyses of the genesis of other media and the way they are similar to or diverge from our model. (Gaudreault & Marion 2002: 12)

It is necessary that I reinterpret the criteria of their model for application to online video, in terms of the development thus far of digital technology and the culture that has grown up around its use, both of which have been discussed throughout digital media arts scholarship.

2.3   Adaptation of Gaudreault and Marion's Criteria of Medium Autonomy

Criterion 1:   'Institution'

Following Gaudreault and Marion's use of the term in relation to cinema, *institution* refers to the entire industry that grew up around film technologies. The autonomous medium of cinema could not be established until the institutional resources had been put in place that would facilitate and determine its cultural impact, for example, studios for the factory production of film product, the physical space of the cinema, advertising, and so on. This conceptualisation of an institution theoretically allies a physical space, or a collection of physical spaces, to the industrial processes, customs and practices that take place within those spaces. From the point of view of contemporary digital culture, the adaptability of digital data that has underpinned the proliferation of so many types of digital media likewise facilitates the convergence of hitherto distinct aspects of the institution, such as the production, distribution, and access to the digital arts, and their promotion, within the space of the Internet.

Early in digital media arts scholarship Binkley considered the implication of digital data for cultural institutions: 'When the medium breaks down, so does the context of meaning, followed by meaning itself. [...] What happens to our hallowed cultural institutions such as museums and theaters when they can be simulated and interconnected to any other imaginable environment?' (1990a: 238; 239). My answer to his question – speaking from the perspective of contemporary culture – is that these institutions have not been replaced by digital technology. Rather, they coexist with interactive interfaces to digital versions of the museum collection or theatre performances, which cohere within the space of a new institution – the Internet.

Gaudreault and Marion define the medium as a relatively specific semiotic configuration supported by a technology of communication that emerges 'in relation

to social and institutional practices of producing and appropriating public messages' (2002: 15). In the case of cinema, these social and institutional practices – industrial film production and public cinema attendance – are as essential to the institution of the cinema as its technologies of production and distribution, and the film text itself. Despite providing a similar cultural service to cinema – entertainment and information – the considerable scope of the Internet through which we view online video, but also communicate and socialise with each other, radically extends the concept of the institution that Gaudreault and Marion describe.

Nicholas Negroponte's study of culture in a nascent virtual realm, in his book *Being Digital* (1995), provides an early theoretical articulation of the institution of the Internet. Using his concept of *digitality*, he attempts to define the specificities of a contemporaneous culture that had begun to be mediated by the digital technologies of mobile telephony and the Internet. This concept, which describes a social and cultural penetration of digital technologies, illustrates the early stages of the development of the institution of the Internet.

Criterion 2: 'Means of transmission and its technological possibilities'

Gaudreault and Marion formulated their model in order to theoretically distinguish cinema's 'historically demonstrable irruption as technology,' from its constitution as an autonomous medium (2002: 13).

The appearance of a medium occurs in the irruption of its technology, or, the period in which it was invented, where 'despite the "attraction" of the new apparatus, despite its status as a technological novelty, the medium was nevertheless used back then to do the same old things' (*Ibid.* 14). The subsequent stage of medium development is marked by the emergence of, and a process of negotiation between, two concurrent tendencies: 'The first is haunted by the syndrome of the novelty and relates to a concern with the profilmic,[73] through a process that has been called "cinematic intervention". The second relates to the medium itself and thus acts upon certain of its inherent features' (*Ibid.* 17). In this, as they term it, *monstration* period of media development, cinema began to show the first signs of its future manifestation as an autonomous medium.

Their model of the genealogy of media traces a trajectory of media development spanning those three stages: its irruption, its monstration and its constitution. Given that the medium is 'not yet clearly prehensible' (*Ibid.* 15) in the mere appearance of a new technology, its future potential as a medium is nonetheless rooted in its technological specificities, which are apparent in its irruption and develop through its period of emergence. For example, they find that the new representational paradigm that cinematography introduced to media culture was foundational to cinema's autonomy as a medium. The technological specificities of cinematography were essential to the formal specificities of the representational

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[73] Occurring in front of the film camera.

paradigm that cinema developed, and of its communicative and relational devices that are founded on those formal specificities.

This study of online video, which seeks to establish the autonomy of the digital audiovisual medium, must therefore determine the technological specificities of the digital technologies that underpin online space. The technological specificities of the virtual realm and of the digital arts have usefully been identified and examined throughout digital media scholarship, providing suitable theoretical tools for this study's selection criteria and methodology of analysis.

Criterion 3:   'Semiotic configuration'

Gaudreault and Marion describe how the technological difference between chronophotography and cinematography introduced 'a truly new representational paradigm' (2002: 13) into media culture.   They contrast the representational implications introduced by cinematography's technological possibilities with the merely quantitative difference that chronophotography's technological possibilities introduced to photography.   This underscores the reciprocity of the technological specificities of a mediating technology and their formal articulation in the media arts, which is at the centre of their model of medium autonomy.   It also establishes the formal features of the media text as the key site of empirical research into medium autonomy.

While they do not thoroughly specify in their essay what they mean by the term 'semiotic configuration', it is clear from their argument that what this term refers to is the representational paradigm established by the formal construction of the film text, or, how it looks and sounds.   The term semiotic denotes the process whereby we make meaning from the system of signs that comprise linguistic or non-linguistic forms of communication.   Accordingly, the configuration of these sign systems refers to their formal construction in particular forms of communication – a film or an online video, for example.

The formal articulations of the technological specificities of the technologies that mediate online video serve as the selection criteria governing my empirical research into online video.

Criterion 4:   'Communicative and relational devices'

Gaudreault and Marion assert that: 'The constitution of the cinema as a medium corresponds to the coalescing of a move towards complete narrativity' (2002: 17). The 'complete narrativity' to which they refer began to dominate cinema after its irruption and emergence, and is generally termed 'classical narrative cinema'. It is characterised by the linear, chronological unfolding of audiovisual narrative and continuity editing – a style of film production designed to elide the technological processes necessarily involved in cinema in an attempt to seamlessly present the film's narrative.

The communicative and relational devices of cinema to which Gaudreault and Marion refer in their essay comprise the communicative, or conceptual, implications of the formal features of the film text, and their relation to each other within the film text, or their narrative operation.

The genres of online video already engaged by the social sciences illustrate the development of online video's conceptual and narrative devices from its irruption until the monstration period. Viral video demonstrates the *irruption* period of Gaudreault and Marion's model because it maintains the conceptual and narrative devices of its forebears in TV advertisements, TV sketches or home video, for example, but establishes new modes of delivery using the video-streaming interfaces that were introduced by digital technology. Vidding demonstrates the *monstration* period of online video. Being a fan labour practice that appropriates the themes, icons or diegeses of existing audiovisual media, it largely maintains their conceptual devices, while it places them in a new narrative context. Machinima also demonstrates the *monstration* period of online video. Because this is a fan labour practice that similarly appropriates the existing themes, icons and diegeses of

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computer games, it maintains their conceptual devices, but places them in new narrative contexts.

These genres of online video that demonstrate the irruption and monstration periods of the genealogy of the digital audiovisual medium, prepare the ground for its constitution as an autonomous medium. It is important to note, by way of these examples, that rather than proposing a linear process of development of the digital audiovisual medium, the current study engages the field of online video wherein a number of practices that demonstrate its irruption, monstration or constitution coexist.

2.4   The Technocultural Articulation of Medium Autonomy

The following details the fundamental aspects of the methodology of analysis that I employ in this research project, in order to establish the autonomous digital audiovisual medium. It is rooted in Gaudreault and Marion's model of medium autonomy, informed by existing digital media arts scholarship and comprehends the institutional context, technological specificities, formal features and conceptual and narrative devices of contemporary online video.

Institutional Context

The digital technology to which Binkley attributes the breaking down of the medium had significant implications for materially bound theoretical interpretations of the medium. As virtuality subverts an essential principle of existing theories of the medium – their circumscription by a material substance – it, as Binkley also noted, likewise subverts an essential feature of how institutions have hitherto been understood – their circumscription by physical space. The fundamental virtuality of digital data negates the physical space that was required by pre-digital arts, enabling their abundant (virtual) existence in the databases that underpin the Internet. The Internet has largely democratised the virtual space that the digital arts occupy[74] (if anything can be said to occupy a virtual space), enabling unprecedented access to the digital tools of their production, distribution and reception.

The online video types that have already been acknowledged by the social sciences – viral, vidding, and machinima – manifest some features that are specific to the institution of the Internet within which they have emerged.

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[74] I do not mean that the Internet is freely accessible to all citizens of the planet, rather that the digital network extends access to digital arts and cultural practices to an unprecedented volume of global users or audience. See Evgeny Morozov, *The Net Delusion: How Not to Liberate the World* (2011), for more on the inherent social and cultural inequalities of the digital network.

Viral video is so-called due to its perceived popularity, which is measured by the number of hits (views) that are accumulated by a particular video streamed through a particular video sharing website. A viral video achieves a high number of hits as a result of being shared amongst digital media users through the digital network, on, for example, social media platforms. This genre of online video is thus defined by its operation within the institution of the Internet, in terms of its means of distribution and access, and of the necessary social dimension of its processes of distribution and reception.

Vidding is defined by its practice, centred on the appropriation of existing media texts, which are then remixed to produce another media text. Being a fan labour practice, vidders produce vids that are based in their favourite media narrative, diegesis or personality. Given the fact that the existing media that they use in their vids is stored in and retrieved from databases that are accessed through the Internet, and in addition, the fact that vids are primarily distributed on the Internet, vidding is also defined by its relation to the institution of the Internet.

Machinima – the use of real-time computer graphics engines to produce video – is defined by its formal appropriation of the diegeses of other digital media types, particularly computer games. These videos are often produced on the Internet, within online virtual worlds such as *Second Life*, so they too are defined by their relation to the institution of the Internet.

While these established online video genres tend to reproduce the formal features of existing media types, both analogue and digital, the ways in which they are produced, distributed, accessed or promoted are specific to the institution of the Internet. Therefore, their practices and socio-cultural operation, rather than their formal construction, is specific to this institution.

Gaudreault and Marion consider the institution of cinema from an economic point of view, stating that the constitution of the medium 'will appear when its quest for identity and autonomy coincides with institutional recognition and a decisive improvement in the economic resources devoted to its production' (2002: 16). In light of their application of the model to cinema, we can appreciate that without considerable financial resources, the physical spaces, extensive equipment and other material and organisational resources, the institution of the cinema could not have been established, nor maintained. The industrial practices that are ancillary to the film product, advertising and promotion, for example, also rely heavily on financial resources. Economics, therefore, held a major significance for the operation of the institution of cinema.

The establishment and maintenance of the Internet also requires considerable financial resources. However, as it is the institution of myriad social, informational, cultural and creative practices, those financial resources extend to support digital culture in general rather than one specific sphere of digital arts practice. Thus, we can appreciate how economic concerns are less relevant to the practice of online video than they were to the practice of cinema. The production and distribution of online video is far less reliant on financial resources. The digital democratisation of tools of video production and distribution, coupled with the advancing improvement of the output quality of digital tools, has largely eliminated the need for the significant financial investment that was crucial for the practice of cinema. Also, the homogeneity of digital data has facilitated the convergence of online video's means of production, distribution and access, and of its promotion, unifying them within the space of the Internet. This significantly increases online video's access to a global

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audience and its market penetration without the need for significant financial investment in advertising and promotion.

The institution of online video – the Internet – forms the essential conceptual backdrop to the ensuing study. It serves not only as the virtual location of online video practices, but comprises the technologies through which online video is mediated. These technologies are the basis of the interrelated formal, conceptual and narrative devices that are specific to digital audiovisuality.

Technological Specificity

Digital media arts scholarship to date has engaged and detailed various aspects of the irruption and monstration of digital technology. A number of its texts are particularly valuable to this research project because they have identified the technological specificities of digital technology, hypothesised its technological possibilities, and analysed some of its emergent features. In addition to providing valuable research into the specificities of digital technology, the scholarship also delineates exemplary technocultural methodologies of analysis. Absorbing and building on existing digital media arts scholarship, the current research project makes a contemporary contribution to this field of discourse.

The scholarship of the techno-utopians is useful to this research project because, despite their sometimes fantastic claims, they nevertheless importantly focused on the technological specificities of the newly emerged technology, in order to imagine their potential future development. Subsequent research undertaken by evolutionary digital media theorists is also useful to the current project, because their discourse of continuity between analogue and digital media was nonetheless, somewhat paradoxically, based in the specificities of digital technology. It was the

inherent mutability of virtual digital technology that allowed the digital media types on which they wrote to reproduce the aesthetics and experiences of analogue media. In later scholarship, research into medium hybridity and specificity is useful to this research project because it identified and analysed the first identifying marks – or the monstration – of the digital medium in online space and in the digital arts.

The techno-utopians Binkley and Holtzman, and Manovich – who treads the line between evolutionary and revolutionary digital media theory – have identified and analysed the technological specificities of the digital arts and online space. Binkley noted how the 'strictly mathematical regimens' underpinning the new digital media were delimited by logic, rather than by the material limits of physical substances according to which analogue media were typically defined (1990a: 235). Using video as an example, he later identified the differences between analogue and digital: 'analog video transcribes light into electric current, while digital video converts light into pure numbers dissociated from any physical unit' (Binkley, 1997: 109). This numerical basis, he deduces, endows digital technology with a 'preternatural pliability' (Binkley 1990a: 234).

Grounding his argument in digital technology's mutable data, Holtzman identifies how interactivity with the virtual realm through the digital interface offers an 'opportunity to follow a unique route that responds to your interests, your choices, and your decisions,' adding, 'It's the uniqueness of each interpretation that is the essence of a digital aesthetic' (Holtzman 1998: 127-8). Prefiguring Gaudreault and Marion, he suggests that we must 'first strip digital media to their essential qualities to isolate the characteristics that define what is digital' (*Ibid.* 123), in order to establish a digital aesthetic.

Considering the experiential implications of interactivity, Manovich asserts that 'where old media relied on montage, new media substitutes the aesthetics of continuity' (2001a: 143). Here he identifies the experiential difference between the discrete, materially circumscribed, texts of analogue media culture and the continuity between digital media texts that occupy the virtual space of the Internet and so, are interactive. He notes how, due to interactivity, 'information access becomes a key activity of a computer age,' suggesting that 'we may even call the database a new symbolic form of the computer age' (*Ibid.* 217; 219). The language of new media that Manovich proposed in his research comprises 'the emergent conventions, the recurrent design patterns, and the key forms of new media' (*Ibid.* 29) that are rooted in these specificities of digital technology.

Binkley, Holtzman and Manovich usefully identify numerical data, interactive processes, the interface and the database that facilitates this interaction, and the non-linearity of interactivity, as the defining features of the newly emerged digital technology. Digital data – and its superstructures – the programming loop, the interface and the database are technological features specific to online space and underpin our cultural engagement within that space. These four technological features – data (glitch),[75] loop, interface and database – serve as the selection criteria governing my empirical research into online video. The videos selected demonstrated reciprocity between the technological specificities of their mediating technologies and their formal articulation. This is the root of the articulation of the digital audiovisual medium.

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[75] The relationship between digital data and glitch will be discussed in the following chapter.

Conceptual Implications of the Specificities of Digital Technology

Medium hybridity scholarship asserted the experiential monstration of digital technology, with several key contributors – Timothy Murray, Anna Munster and Mark B.N. Hansen – noting the discrepancy between the technologically specific experiences of interaction in digital culture and the formal construction of digital media arts, which tended to appropriate the formal features of pre-digital media.

In 'Digital Incompossibility: Cruising The Aesthetic Haze Of The New Media' (2000), Murray explores this discrepancy in a selection of new media artworks of the period. Their formal conventionality, in which 'the structure of resemblance and analogy continue to solicit the subject,' was disseminated through processes of interactivity that carry 'the uncanny incertitude and semiotic openness of the virtual' (2000). Murray identifies the experiential monstration of the specificities of digital technology in the digital media arts of the period, which did not, however, formally respond to those specificities.

Similarly, in 'Digitality: Approximate Aesthetics' (2001), Munster discussed the hybridity (akin to Gaudreault and Marion's concept of monstration) of digital media of the time, where digital media artworks were formally conventional, but were engaged through innovative technological means. Prefiguring Gaudreault and Marion, her theory of *approximate aesthetics* found the specificity of the interactive digital arts in the approximate relations that they establish between old and new media, diverse configurations of space and time, and between the human being and the artwork. Moving beyond comparative studies of analogue and digital media that were typical of the techno-utopians, she noted that such methodologies were no longer appropriate because digital technologies had promoted 'a different cultural perception

of the image' (Munster 2001). The tremendous growth of interactivity in millennial digital culture had transformed cultural perceptions of the image.

The new perceptions that digital technology introduced to media culture are central to Hansen in *New Philosophy for New Media* (2004). His philosophy attempts to define the experiential specificity of digital media texts, because 'the image can no longer be restricted to the level of surface appearance, but must be extended to encompass the entire process by which information is made perceivable through embodied experience' (Hansen 2004: 10). He argues that the virtually limitless and indeterminate information that circulates throughout the digital network is ultimately given shape through interactivity. Through interactivity the body enframes digital information, transforming 'something that is unframed, disembodied, and formless into concrete embodied information intrinsically imbued with (human) meaning' (*Ibid.* 13). Unlike Murray and Munster, Hansen is unconcerned with the formal articulation of experiences of interactivity. Rather, his research offers interactivity as a digital alternative to the enframing function that had been realised by the physical material of analogue media.

Our cultural engagement through and with online space has significantly expanded since digital arts scholarship identified its technological specificities. 361 million people were using the Internet by the year 2000,[76] that number passed 2 billion in 2012 and as Hansen, Murray and Munster have shown, because of our experiences of engagement with the digital network, we begin to understand and attribute meaning to its technological specificities. This conceptual engagement with digital technologies has become pervasive due to our extensive engagement with the digital network throughout contemporary digital culture.

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[76] Data retrieved from 'World Internet Users and Population Stats', available at http://www.internetworldstats.com, accessed 12/11/2013.

Narrative Operations

Whereas Hansen, Murray and Munster's research illustrated the *experiential* monstration of the digital medium wherein the new experiences of interactivity engendered new cultural perceptions of the image, the medium specificity scholarship that followed asserted the first stages of its *formal* monstration. Jamie O'Neil, Frank Popper and Rosa Menkman's research considered how the new interactive experiences and corresponding new perceptions of mediated images and sounds in digital culture began to be formally and conceptually expressed in digital media arts.

In 'The Remix Aesthetic: Originality Mixed and Mashed-up', O'Neil considers the contemporaneous proliferation of remix practices using digital technology, emphasising the 'important shift in thinking' that these practices introduced to digital culture (2006: 19). O'Neil's remix formally articulates the experiential complexity of interactivity by foregrounding, through collage, the heterogeneity of media types encountered when hyperlink surfing, or browsing, the Internet. Remix formally constructs the image, for example, in a way that emphasises the fact that the media elements that it comprises derive from a number of diverse '"original" source elements' (*Loc. cit.*). The specificities of digital technology are not expressed in the individual elements of appropriated media, but in their reconfiguration in a new digital media text. He explains how the remix 'serves as a qualitative rubric within digital media, and simultaneously, as a bridge that links digital-studies [*sic*] to broader aesthetic practices and issues in contemporary culture' (*Ibid.* 20). He thus importantly recognises how the formal articulation of the technological specificities of a digital artwork draws on broader cultural issues that relate to our experiences of that technology.

In *From Technological To Virtual Art*, Popper's analysis of a wide range of contemporaneous digital arts practices identifies how they distinguish themselves from the technological arts that emerged in the twentieth century through their 'techno-aesthetic creative commitment' (2007: 1). Despite the variation in the types of digital art that he engages, he identifies their common techno-aesthetic creative commitment, whereby the technological and aesthetic aspects of the work form a recursive, generative relationship, and asserts the 'humanization of technology' that characterised contemporaneous culture (*Loc. cit.*). Invoking some of the essential criteria of Gaudreault and Marion's model, Popper's definition of virtual art comprises the technological possibilities of the digital technology involved, the cultural experiences based in those technologies, and their formal articulation of these. He states that the integration of such issues 'allows for an aesthetic-technological logic of creation that forms the essential part of the specificity of the virtual artworks' (*Loc. cit.*).

Menkman's research into the glitch in 'The use of Artifacts as Critical Media Aesthetics' (2009), which she further developed in *Network Notebooks 04: The Glitch Moment(um)* (2011), identifies another nuance of the formal monstration of digital technology. She considers how the glitch – the formal manifestation in a digital work of art of a perceived error in its facilitating technology – introduces technologically specific concepts into the work of art. Building her argument from a technological perspective of machine communications, she examines how human beings draw cultural, linguistic or other contextual factors into communications and thereby 'bring communication into the realm of interpretation and meaning' (*Ibid.* 13). She considers the conceptual significance of the glitch in the digital media arts, which is rooted in our habitual interaction with the technologies of digital culture. She offers

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her methodology as means to research glitch because theorists 'need to be more clear about the relationship between technical and metaphorical or cultural dimensions of glitch culture' (*Ibid.* 9).

O'Neil, Popper and Menkman's recent research into digital creative expression usefully identifies a reciprocity between the technological specificities of digital technology, their formal articulation in the digital artwork, and the conceptual implications of these technologies as experienced in digital culture that they draw into the artwork. While they reinforce the validity of Gaudreault and Marion's comprehensive theoretical approach to the study of the media arts, their research also begins to consider the narrative operation of specifically digital formal features in the digital media arts. By considering the narrative operation of the remix, techno-aesthetics and the glitch, they do not isolate these features in the texts or practices that they study. Rather, they take a holistic approach to the examination of the operation of these features in relation to the other features of the artworks or practices that they interrelate with.

These studies usefully offer exemplary analytical methodologies for the study of narrative in the context of the digital arts, which inform the methodology of analysis that I use in this research project.

2.5   The Digital Audiovisual Medium - Methodology of Analysis

The following project seeks to establish the autonomy – to use Gaudreault and Marion's terminology – of the digital audiovisual medium. In order to do so, it examines how the digital audiovisual medium is articulated in online video, by analysing a number of video samples from the online field of practice.

The already established technological specificities of the technologies that mediate online space – digital data, the loop, the interface and the database – served as the criteria according to which I selected samples of online video that were appropriate to the project of research. The twelve sample videos that I examine throughout this thesis were selected due to their formal articulation of these technological specificities in online video. While the formal articulation of these specificities of the technologies that mediate online video, in online video, will be comprehensively analysed in the following four chapters, it is necessary at this point to give some familiar examples of these technological features, which we encounter in contemporary digital culture.

Digital Data (Glitch)

When we see a low-resolution and therefore pixellated image on a webpage, its blocky appearance is the result of the inability of the digital data involved to satisfactorily reproduce the intended image. The pixellation visibly intervenes in the expected reproduction of that image, producing its erroneous presentation. This error, or glitch, in image reproduction, enables us to perceive the digital data that is typically elided from view in optimally functioning digital technologies.

Loop

When we open a number of tabs on an Internet browser, each of the webpages that have been loaded on each of the tabs operates independently from the rest. This is because the programme governing each page runs independently of the others according to the particular programme, or set of programmes, that underpins it.

Interface

When we engage virtual online space through an Internet browser, for example, we are aware that the browser is an interface through which we, in the lived world, can access and interact with this virtual space.

Database

When we perform a search using *Google* or any other kind of search engine, we endeavour to choose the most specific search terms possible. We do this because the search engines grant access to an almost limitless, and ever-expanding, cache of media files, archived in the databases that underpin the Internet.

Glitch, loop, interface and database served as the selection criteria governing my empirical research into online video. Accordingly, they also serve as the central criteria of my methodology of analysis, which systematically attends to the formal articulation of these features, their relation to the technologies of the digital arts and online space, the conceptual implications that they draw into the online video and the narratives that their interrelation with the other content of the videos produces. Thus, the analysis of online video in this thesis is shaped by four key research questions:

1   How is the glitch, loop, interface or database audiovisually formalised in the videos?

2   How does the formalisation of the glitch, loop, interface or database relate to the digital technologies that underpin the digital arts and online space?

3   What conceptual implications does the audiovisual formalisation of the glitch, loop, interface or database introduce to the videos?

4   What narratives does the interrelation of the formal the glitch, loop, interface or database with the other content of the videos produce?

Gaudreault and Marion unify the criteria of their model under a specific media arts practice, that of cinema. This importantly introduces the concept of a coherent practice within which the autonomy of a medium is established. This coherence is manifested by a number media texts that can be deemed similar – not from the point of view of the *meaning* of their narratives, images or sounds, but rather, in terms of how they *do* what they *do*. The analysis of twelve online videos undertaken in the following four chapters establishes how these videos *do* what they *do* – technologically, formally, conceptually and narratively. In so doing, it establishes the autonomy of the digital audiovisual medium in relation to a coherent digital audiovisual practice, rather than in relation to individual online videos.

The autonomy of the digital audiovisual medium will be established in the formal, conceptual and narrative articulation of the technological specificities of the digital arts and online space – the glitch, the loop, the interface and the database – in a selection of online videos. The results of the individual studies of each technological feature will be synthesised in chapter 7 of the thesis in order to establish the autonomous digital audiovisual medium.

Chapter 3:   Glitch

> Glitch genres perform reflections on materiality not just on a technological level, but also by playing off the physical medium and its non-physical, interpretative or conceptual characteristics. To understand a work from the genre of glitch art completely, each level of this notion of (glitch) materiality should be studied.
>
> Rosa Menkman
> *Network Notebooks 04: The Glitch Moment(um)* (2011)

A glitch, or 'digital tick caused by lost or incorrect binary code' (Kelly 2009: 6), is the formal manifestation of the occurrence of malfunction within a digital system. It was first creatively used in 1990s glitch music, where composers incorporated sonic artefacts[77] produced by the failure of computing technologies into their music. Such glitches typically derived from the corrupted compression/decompression of digital data,[78] an overloaded digital amplifier or CPU,[79] signal corruption,[80] feedback,[81] system bugs,[82] system crashes,[83] hardware noise or skipping CDs.

Making use of artefacts of error that would have customarily been considered extraneous to effective communication (referred to in communication theory as *noise*),[84] glitch composition practices introduced the conceptual implications of noise to music composition and, consequently, to music scholarship. As the glitch in glitch music makes the underlying technological data processes audible through the

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[77] I borrow this term from Rosa Menkman in 'The use of Artifacts as Critical Media Aesthetics' (2009).

[78] Data compression is the process that reduces the amount of bits whereby information is encoded in order to reduce the level of resources required for data storage space or transmission, for example. The process is reversed in decompression. For more information see: Graham Wade, *Signal Coding and Processing* (1994).

[79] A CPU (central processing unit) is the computer hardware within which the instructions of a computer programme are carried out.

[80] The failure of a communication channel to produce an exact reconstruction of a signal.

[81] See: Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (1948).

[82] A system bug is a coding error in a computer programme.

[83] A system crash occurs when a computer or a programme fails to function correctly.

[84] See: Claude E. Shannon, 'A Mathematical Theory of Communication' (1948); Claude E. Shannon, and Warren Weaver, *The Mathematical Theory of Communication* (1971); Rosa Menkman, *Network Notebooks 04: The Glitch Moment(um)* (2011).

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sonification [85] of their malfunction, so the glitch in online video manifests technological error audiovisually.

Building on his earlier research that found: 'Since, ordinarily, channels have a certain amount of noise, and therefore a finite capacity, exact transmission is impossible' (Shannon 1948: 48), Claude E. Shannon's model of machine communications (that he later developed with Warren Weaver) emphasised how technologically mediated communication always comprises a degree of error.[86] In music composition or in audiovisuality, the incorporation of noise or glitch – the manifestation of the less than optimal operation of their facilitating technologies – into a piece of music or audiovisual work introduces the concepts of error, imprecision, or the transgression of their technology's operational limits to the musical or audiovisual narrative. It thus formally and conceptually emphasises the fact of their mediation.

Chapter 2 of this thesis offered the pixellated image as an everyday example of the glitch. Pixellation in an image overtly manifests the degree of error that is necessarily implicated in its underlying digital technology, and therefore, the imprecision of that technology in digitally reproducing the image. [87] Pixellation occurs in images that have a low resolution, or a limited range of values with which to describe the image to the digital system that reproduces it. Its characteristically blocky appearance emphasises the degree of noise – or error – that is involved in the digital reproduction of the image, or in other words, the insufficiency of its data range to accurately reproduce the image.

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[85] To convey information or perceptualise data through the use of non-speech audio. For further information see: Gregory Kramer, 'Auditory Display: Sonification, Audification, and Auditory Interfaces' (1994).
[86] See *The Mathematical Theory of Communication* (1971)
[87] For a more detailed explanation of how digital media are distinguished from analogue media, see the Appendix to the thesis.

Pixellation was typical of early digital culture, particularly in the early graphics applications of video games and websites. It visibly reproduced the limits of the data that was available to early digital technologies for reproducing an image, for example, by making curved edges and shapes look blocky. The pixellated image is thus a hybrid image that comprises both the reproduced image and the formal articulation of the digital system's inability to accurately reproduce that image.

The glitch – of which pixellation is one manifestation – has long been a feature of the sonic and visual digital media arts, first appearing in so-called glitch music and subsequently in glitch art. Due to the democratisation of the tools of digital video production, distribution and access, and in response to the expansion of digitally mediated culture, the glitch has recently emerged as a key feature of online video. The most prominent contemporary glitch audiovisual practice is the datamosh.[88] Datamoshing is the intentional corruption of digital video files, typically using lossy video codecs.[89] It deteriorates the video image into pixels, which visually bleed into one another, creating a swirling or morphing visual effect that eradicates any semblance of the original image.

The recent online videos *floVV* (2011) by v5mt, *Glitch* (2010) by Daniel Soderberg and *HARDCORE_GLITCH* (2009) by LePôLe[90] demonstrate a less extreme nuance of glitch audiovisuality, wherein the glitch formally interrelates with – rather than supplants – the content of the video. This produces innovative audiovisual narratives that comprise – in addition to their individual content – the conceptual implications that derive from our cultural encounter with the inherent and technological specificities of the glitch. Following a methodology of close textual

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[88] See http://knowyourmeme.com/memes/datamoshing for a selection of datamosh videos.

[89] In digital processes such as lossy data compression, a means of reducing the size of a media file by discarding some of its data in order to accommodate the bit rate of the desired media-streaming platform, the compression of an image can result in visible pixellation, or compression artifacts.

[90] These videos are available to view at: http://digitalaudiovisuality.com/glitch/.

analysis, in this chapter I critically analyse the technological, formal and conceptual implications of the glitch in these videos. Consequently, I establish how the formal interrelation of the glitch with the content of those videos produces narratives that are discursive of the conditions of contemporary digital culture. Their analysis employs a theoretical model that combines aspects of established digital arts scholarship on the inherent, technological, conceptual and cultural specificities of the glitch and on scholarship concerning the technological and conceptual principles of media communications.

Section 3.1, 'Creative context of the videos selected for analysis', establishes the context of the glitch videos analysed in this chapter, in terms of trends within the bodies of work of the artists responsible.

Section 3.2, 'The audiovisual formalisation of the glitch', addresses the formal construction of each of the videos from the perspective of the inherent specificity of the glitch – outlined by Caleb Kelly in the first paragraph of this chapter – in terms of its manifestation of error in a mediating technology, and therefore as the formal articulation of the processes of technological mediation.

The analysis of the glitch's formal articulation of the videos' underlying technology undertaken in section 3.3, 'Glitch and technology', exploits Binkley's conceptual model of the technological specificities of digital media (1990b) and of the opacity of data in optimally operating digital technology (1997) and Iman Moradi's theory of the technological ontology of the glitch (2004). It is also informed by John Fiske's conceptual model of media convention (1982) and Menkman's research into the technocultural implications of the glitch (2011).

Section 3.4, 'Conceptual implications of the glitch', the analysis is underpinned by Holtzman's assertion of the technological essence of the digital that is

articulated in the transgression of its operational limits (1998), Menkman's expansion of the scope of the glitch's conceptual significance (2011) and Fiske's theory of the purpose of convention (1982), against which I establish the communicative capacity of the glitch. In addition, Paul Virilio's identification of the potential for error that exists in all technological inventions (2001), coupled with Mark Nunes' theoretical model of the 'poetics of noise', in which error is foregrounded in creative practice (2011), informs my analysis of the conceptual implications of the glitch in the videos.

In section 3.5, 'Glitch narrative', I elucidate how the interrelation of the glitch with the individual content of the videos analysed produces narratives that are discursive of the role of digital technology in contemporary culture. The analysis is informed by Torben Sangild's theory of the narrative operation of the glitch in glitch music (2004a), Evan Meaney's theory of the dual significance of the glitch in video narrative (2010b) and William Brown and Meetali Kutty's critical analysis of the datamosh (2012). In addition, Virilio's critical perspective on the technological arts (2001) and Greg Hainge's theoretical model of the digital elision of its inherent error (2013), further illuminate the analysis.

Rather than being selected for discussion simply because they involve glitch, *floVV*, *Glitch* and *HARDCORE_GLITCH* are key to the current discussion because they demonstrate the conceptual complexity that the glitch introduces to online video, producing innovative audiovisual narratives that formally, and thus conceptually, implicate digital technology. These implications of the glitch derive from experiences of engaging with the technologies of digital culture, which likewise informs the narrative significance of the glitch in these online videos. Despite their differing formal strategies of glitch, the videos are nonetheless related through their formal

articulation of the inherent, technological and conceptual specificities of digital data and their narrative articulation of its contemporary cultural significance.

floW comprises two types of functional glitch. The initial 'dropped frames' glitch is an authentic glitch that articulates the occurrence of an error in the digital video file. The subsequent glitches in the video, contrived glitches, suggest that the digital software underpinning the digital media player, through which the video is streamed, is malfunctioning. Despite their ontological distinction, both types of glitch formally articulate a failure in the technology that underpins this video, and thereby emphasise the fact of the video's mediation. The interrelation of those glitches with the content of the video – images that depict elements from a history of the Western visual arts – emphasises the fact of their mediation through digital technologies in this video. It also emphasises how digital technology underpins our access to them in the digital database. Consequently, the video's narrative relates the digital mediation of our shared cultural heritage, and by extension, of contemporary digital culture.

Glitch comprises two different types of glitch. The first type, the 'functional' glitch, pervades the video's soundtrack and suggests that there is an error in its mediating technology. Thus, these glitches draw attention to the means of the video's mediation. The second type, the 'structural' glitch, pervades the video's visual track and subverts the conventions of image and audiovisual production. By subverting those conventions, these structural glitches draw attention to the conventions that were established to elide the agency of the technologies involved. *Glitch*'s structural glitches, which formally interrelate with images of the systems that underpin urban spaces, likewise draw attention to the typically elided technological systems that underpin urban life. The video's functional glitches illustrate the potential for error that exists in these technologies. Formally interrelated with images of urban systems,

the functional and structural glitches in this video produce a narrative that relates the inherent precariousness of the digital technologies that mediate urban life.

The audiovisual narrative of *HARDCORE_GLITCH* is entirely modelled through glitch. The video's visual and sonic glitches formally articulate that the operational limits of digital technology underpinning the video have been transgressed. Thus, they overtly formalise the potential for error that is a necessary part of the video's underlying digital technology. The human beings that feature in *HARDCORE_GLITCH* are modelled through glitch. The video thereby melds the human form with the artefacts of digital technology. This emphasises the imprecision inherent in the digital technological reproduction of the human form. As a result, the video's narrative articulates the inadequacy of digital data to accurately reproduce the human being. It also relates that a digitally mediated human being is increasingly at the centre of our engagement in contemporary culture.

The narratives of these videos, through their innovative and varied formal interrelations of glitch with the familiar settings and objects of everyday life, articulate the cultural-political specificities of the contemporary experience, which we share, through the digital network. The roots of such specificities were identified and analysed by commentators on the early period of digital culture in the 1990s. Notably, Mark Slouka's essays, *War of the Worlds: Cyberspace and the High-tech Assault on Reality* (1996a) and 'The Illusion of Life Is Bought Dearly' (1996b), identified the early cultural-political impact of digital technologies on contemporaneous concepts of space, identity, reality, place and community. In this relatively early period of digital culture, he critically analysed the roots of the specificities of digital technologies that influenced, and would continue to influence, our lives, which are increasingly

infiltrated by these technologies. His research began a critical discussion of such cultural, political and social matters that remain central to the analysis of the impact of digital technologies in the contemporary cultural period.

Slouka examined the cultural fallout of the digital technological revolution in the 1990s. For him, the introduction of digital data to the cultural landscape of the period, where our cultural engagements, social interactions and the objects of culture themselves were beginning to be mediated by virtual data, posed extensive consequences for our cultural and political lives. He makes a key argument in his research: virtual reality becomes blurred with real life when we identify as readily with the virtually mediated representations of ourselves that take our place in our engagements within the digital network (which, in the contemporary period, range from our profile pages on social networks, to avatars[91]) as we do with our physical selves; when we accept virtually mediated representations of communities as indistinguishable from communities in the real-world; and when we feel that we inhabit virtual, digital space and places within that space in the same way that we do the space and places of the physical world. In this process, whereby our vision and understanding of ourselves and our world merges with digital data, he points out, society, our world and our place within it simultaneously merge with the corporate interests that bolster the digital network.

These ways in which our concepts of, and relationships with, reality were beginning to merge with illusion in the late 1990s, fundamentally turned on our increasing inclination to accept abstractions as the 'real thing'. Finding at the time, that we seemed 'more and more willing to put our trust in intermediaries who "re-present" the world to us' (1996a: 2), Slouka highlights the central cultural-political

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[91] An avatar is a two-dimensional or three-dimensional graphical representation of a user's identity in Internet forums and other online community spaces, or in games or virtual worlds.

implications of digital data that the formalisation of glitch brings to bear in the narratives of the videos analysed in this chapter. Digital data's dematerialisation of the objects of contemporary culture, its corresponding dehumanisation of the participants of culture, and its virtualisation of the spaces, objects and instruments of culture, have transformed our understanding of the relationship between the lived world and the mediated images, sounds or audiovisual works that relate aspects of our world to us. Correspondingly, this has had significant implications for our understanding of the relationship between the virtual realm and the real world. While these aspects of early digital culture were of concern to Slouka in his research of the 1990s, they continue to be of central concern in both the practice and criticism of contemporary culture.

The videos analysed in this chapter and throughout this thesis formally, conceptually and narratively articulate the specificities of the digital technologies that continue to intercede our cultural, social and political experiences. In foregrounding glitch - and by extension, digital data, in a number of ways - *floW*, *Glitch* and *HARDCORE_GLITCH* emphasise the agency of digital technology in the videos' narratives in order to bring the cultural-political implications of digital data to the attention of the public consciousness.

floW's narrative, in which authentic and contrived glitches emphasise both the digital mediation of the video and the objects that it mediates, articulates the dematerialisation of culture that has taken place as a result of the development and subsequent rise of digital technologies. By formally foregrounding its underlying digital technologies through glitch, *floW* critically emphasises both the digital mediation of cultural objects, and by extension, our lived and shared culture, and the precariousness of that technology, which is capable of error or failure.

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The structural glitches in *Glitch* disrupt the video's narrative flow of images of the systems that underpin urban spaces, formally emphasising the fact that these images are being mediated. By formal analogy, these glitches draw attention to the technological systems that similarly underpin urban life. The video's functional glitches explicitly illustrate the potential for error that exists in the technologies that underpin the video, and by analogical extension, those that exist in the technologies that mediate urban life.

The visual and sonic glitches, through which *HARDCORE_GLITCH* is entirely modelled, formally articulate that the operational limits of the digital technologies underpinning the video are being constantly transgressed. By constantly and overtly formalising the potential for error that exists in all technology, LePôLe's video innovatively brings to the artwork similar cultural-political issues that were of concern to Slouka in his writing, and that continue to be of concern to us in contemporary culture. He uses glitch to model the human beings that feature throughout the video, thereby melding the human form with the artefacts of error of digital technology. In this way, his video emphasises that a digitally mediated representation takes the place of ourselves in our engagement with the communities and spaces of the digital network. Articulating the inadequacy of digital data to accurately reproduce the human being in this way, the video emphasises the imprecision inherent in the digital reproduction of the human being that is at the heart of our engagement in contemporary culture.

Of course, the formal, conceptual and narrative articulation of error in an artwork or the formal, conceptual and narrative articulation of a mediated artwork's mediation, in

an artwork is not new - practices that engage similar conceptual categories of error, noise and mediation can be found throughout pre-digital media artworks and practices.

For example, in the field of music composition, noise music[92] originated in the early twentieth century. It was perhaps first practiced by the Futurist artist Luigi Russolo with his noise orchestra of Intonarumori,[93] the noise generators that he designed and built to perform his *Gran Concerto Futuristico* (1917). It continued to be practiced in the mid- twentieth century by noise bands such as the Nihilistic Spasm Band, and in the late century by gabba[94] producers such as The Viper and industrial music[95] bands such as Ministry. In analogue film of the twentieth century, filmmakers such as Norman McLaren and Len Lye scratched, cut or otherwise damaged the filmstrip in order to draw attention to the technological apparatuses of film, and thereby, its processes of mediation. Also, David Rimmer and Al Ruzutis' work in both film and video, in which they manipulated the film/video stock in order to draw attention to the technologies of production and exhibition, was concerned with drawing attention to the ideological and political underpinnings of the cultural apparatuses of cinema.

While there are many similarities amongst the discursive impulses of these noise practices that emerge time and time again throughout such wide ranging fields of creativity, what is key to the current discussion is the specificity of the interrelated formal, conceptual and narrative implications of the glitches that appear in the videos studied, when considered from the perspective of the contemporary techno-cultural

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[92] The musical sub-category of noise music comprises the deliberate introduction of noise to a musical context.

[93] Intonarumori are noise generators that enabled Russolo to control the dynamics and pitch of the noises produced

[94] Gabba is a sub-category of electronic music that is characterised by the incorporation of noise elements.

[95] Industrial music is a sub-category of experimental music that incorporates industrial sounds to produce sonically transgressive compositions.

context within which they emerge. Indeed, this is central to Gaudreault and Marion's model of the genealogy of media - the progression of a technological invention into an autonomous medium occurs in response to the specific institutional, cultural and industrial context of its development. Therefore, the contemporaneous social, political and cultural environment in which a technology develops is key to our understanding of that technology as a medium.

Correspondingly, and as the following argument details, the formal, conceptual and narrative implications of the glitches in the videos are necessarily interrelated and contingent upon one another. Whereas it would be possible to abstract the glitch from its narrative context in order to compare it with the use of noise in other arts practices, this would not allow us to consider the technological, social and political specificities of the culture from within which digital audiovisuality has emerged. It would instead, be a comparative study of glitch practices. By contrast, the purpose of the current study is to undertake a detailed analysis of the glitch - one of the key formal features of digital audiovisuality - in a number of online videos which, when considered cumulatively with the following analyses of the loop, the interface and the database, illuminate my proposed concept of a medium in the digital age.

3.1   Creative context of the videos selected for analysis

The Polish digital media arts collective v5mt's body of digital audiovisual practice[96] is characterised by its overtly digital formal style that typically falls into one of two categories.   The first, of which *floVV* (2011) forms part, represents their earlier audiovisual practice of the period 2010-2011 that centres on the glitch.   The second, represents their subsequent video practice that features the three-dimensional and seamlessly smooth visual rendering for which digital technologies have been championed in videos such as *S H Λ ΛΛ Λ N I X* (2013), *S V R F Λ V X* (2013) and *E X O L Λ B* (2013), for example.   Following the aggressive, glitch laden datamosh video: *xa0s0rdr_cutcut_* (2010) and the rather more subdued, but nonetheless glitch laden, datamosh video: *Distorted beauty* (2010), *floVV* demonstrates a more nuanced approach to glitch audiovisual practice whereby the glitch formally interrelates with, rather than supplants, the other audiovisual content of the video.

The American cinematographer, editor, and motion graphics designer Daniel Soderberg's independent audiovisual practice[97] centres on the short narrative.   His work comprises documentary narrative: *Avedano's Tribute* (2011), for example, dramatic narrative: *Inside* (2010) and *Near the Parenthesis* (2010), for example, and less conventional approaches to audiovisual narrative: *Natural Color* (2010) and *Glitch* (2010), for example.   Regardless of the narrative category within which he works, Soderberg's audiovisual practice is – unsurprisingly, given his range of talents – marked by a keen and innovative visual style that is fundamental to his method of storytelling.   The visual style of *Glitch* is characterised by its subversion of the conventions of photographic imaging and of audiovisuality, through which he

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[96] V5mt's work is available to view at: http://vimeo.com/v5mt.
[97] Daniel Soderberg's work is available to view at: http://vimeo.com/user2314715.

demonstrates a development of the glitch beyond its typical classification in terms of technological function.

LePôLe is a French digital audiovisual artist who generates digital technological faults, errors and bugs that he uses in his video production practice.[98] His innovative audiovisual practice runs the gamut from glitch inflected dramatic narratives: *Vin sur Vin* (2012) and hip-hop videos: *Rien ne dure* (2010), to art video: *TRANS_GENRE* (2010) and videos of glitches in action: *Dead Cities* (2011), *Floppy fail* (2013) and *./ Point Barre* (2013), for example. *HARDCORE_GLITCH* (2009) is indicative of his interdisciplinary and eclectic approach to audiovisual narrative. Modelling the human body through an abundance of glitch and setting the visual narrative to a driving musical rhythm that similarly incorporates an abundance of glitch, this video integrates a number of visual, sonic, narrative, thematic and conceptual features that were to occupy his subsequent digital audiovisual practice.

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[98] LePôLe's work is available to view at: http://vimeo.com/tntb.

3.2   Audiovisual formalisations of the glitch

floVV, *Glitch* and *HARDCORE_GLITCH* each demonstrate nuances of the inherent specificity of the glitch, as described by Caleb Kelly in the introduction to the chapter. As he noted, the glitch manifests an occurrence of technological error in a digital system.   The wide range of visual and sonic glitches that populate these videos formally articulate the manifestation of error in the digital technology that underpins them or the subversion of its conventional use or operation.   Consequently, they formally emphasise the means of their mediation.

Fig. 3.1 *floVV* (2011) by v5mt

In *floVV*, the initial technological 'dropped frames' glitch and subsequent visual glitches pixellate and degenerate its sequence of images.   Invading the video's sequence of images that spans a history of western visual culture, these glitches form part of its audiovisual narrative.   Drawing the glitch's inherent specificities as the manifestation of technological error into the narrative, they thereby formally emphasise the technological means of the video's mediation.
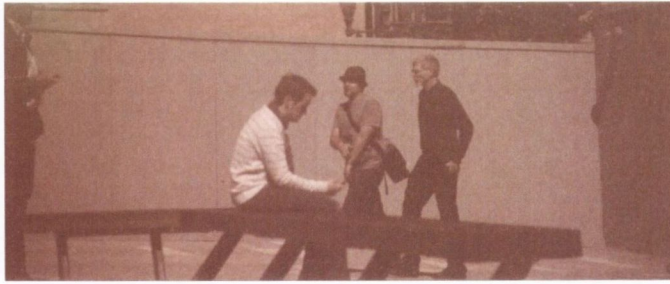
Fig. 3.2 *Glitch* (2010) by Daniel Soderberg

Glitch incorporates a variety of glitches that formally subvert the conventions of imaging and audiovisuality, both of which underpin the video's production. A wide variety of photographic and structural glitches pervade the video's narrative, which comprises a fast-cut sequence of images of various systems that underpin the city. The soundtrack of the video comprises jarring discordant sounds that are foregrounded in its narrative. The video's combination of glitches formally emphasises the technological means of its mediation by subverting the conventions of their use.

Fig. 3.3 *HARDCORE_GLITCH* (2009) by LePôLe

Glitches dominate the audiovisual narrative of *HARDCORE_GLITCH*. The human beings that feature throughout this video are exclusively modelled through glitch. These glitches take the form of chromatically over-saturated, exaggerated pixels. The soundtrack of the video echoes its visual style by being composed entirely of sonic glitches. The profusion of visual and sonic glitches throughout this video formally

articulate, in a number of ways, the technologies underpinning it are malfunctioning. This draws our attention to the technologies that mediate the video.

In these videos, the use of glitch as a means to emphasise the fact and means of the videos' mediation, of technological error, and to visibly and aurally subvert the conventional use of the technologies involved, formally articulates the digital specificities of a culture that is increasingly mediated by digital technologies. In employing glitch in this way, these videos bring to the public consciousness the central issues of the cultural-political impact that digital technologies have wrought on the contemporary period. This impact was initially identified and critically analysed by early digital theorists such as Mark Slouka (1996a; 1996b), and continue to be critically engaged by Jeremy Rifkin (1994; 2009; 2011; 2014). While these theorists take differing methodological approaches to the problem of the cultural impact of the specificities of digital technology - its cultural-political impact on questions of identity, reality, place, space and community, and its socio-economic impact as a central feature of contemporary globalisation - the issues central to the discussion remain the same. Fundamentally, these cultural-political issues concerning the ways in which digital technology intervenes, and thereby, has a demonstrable impact on our lived culture - which have been and continue to be of concern to digital theorists and critics of the social, economic and political aspects of digital culture - are formally articulated in *floVV*, *Glitch* and *HARDCORE_GLITCH*.

Of course, the history of arts and creative practices comprises a wide range of formal and aesthetic strategies that achieve, if they are considered in the most general terms, similar ends. The glitches in these videos draw attention to a number of technologies that underpin them, thereby drawing attention to the fact of their mediation. It could be argued that the small sample of noise artists briefly discussed

above: Luigi Russolo, Nihilistic Spasm Band, The Viper, Ministry, Norman McLaren, Len Lye, David Rimmer and Al Ruzutis, achieved the same ends in their work, and so it could be erroneous, perhaps, to consider, as I do in this chapter, the digital specificity of the use of glitch in these videos. In response, it is necessary to point out, therefore, that it is not because of the mere indication or assertion of the fact of technological mediation, which is formally expressed in these videos by the glitch, that I argue for the glitch in digital audiovisuality as a digitally specific formal, conceptual and narrative entity. Rather, I argue for the digital specificity of all of those combined aspects of the technological glitch in relation - specifically - to the technocultural context within which digital audiovisuality has emerged. Therefore, I critically analyse the specificity of the glitch's relation to the digital technological context from which it literally emerges (in the video itself); to the institution within which it operates (the Internet); and to the cultural specificities of its fundamental digital technologies as they facilitate the operation of the space of the Internet - upon which the operation of digital culture largely rests. By establishing this specific conceptual context of the current project of research, it is possible to then consider the technological, formal, conceptual and narrative particularities of the glitch, given the centrality of digital technologies in contemporary culture.

As will be made clear by the argument that follows in this chapter, it is only from a comprehensive analysis of all of these contributing and interrelated features of digital technologies that are specific to the current period that the autonomy of the digital audiovisual medium can be accounted for. While this need for wide-ranging contextualisation has been thoroughly spelled out by Gaudreault and Marion in their model of the genealogy of media, it is - as the literature review (Chapter 1) showed - a fundamental methodology that is common to the broader field of research. While

such a methodology has rarely been as clearly defined as it was by Gaudreault and Marion, its key features of critical consideration can be found throughout digital media arts scholarship.

flo\/\/ comprises a number of different types of glitch that appear to interfere with a potentially conventional video presentation. This use of glitch, which impedes the flow of the video, gives the impression that the underlying software has been corrupted in some way.

The first glitch, which appears at the very beginning of the video, articulates that there has been a loss of frames in the original video file. It does this through the vacillating image of a test card.[99] Following the initial distortion glitch, a number of other types of glitch pixellate and degenerate these images, producing partially formed glimpses of them that require the audio-viewer[100] to anticipate and mentally reconstruct the flow of images that they corrupt. They persist throughout the video.

V5mt incorporate these glitches into their presentation of a sequence of images that refers to a history of western visual culture, from commercial classical sculpture, graphic design and photography, to the Greek alphabet (specifically the word, ετερναλ – meaning eternal), early twentieth-century animation and 1990s rave/acid house iconography. The glitches pervade the video with technological failure, formally emphasising that this video is mediated by digital technologies.

The glitches in *Glitch* subvert the conventions of imaging and audiovisual production. Soderberg's rapid sequence of shots depicts various integral aspects of

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[99] Test cards are the once physical, now largely virtual, test patterns that are used for calibrating or troubleshooting audiovisual equipment for optimal functionality.
[100] I borrow this term from Michel Chion in *Film, a Sound Art* (2009) because in terms of audiovisual media, it is '[A] term more accurate than *viewer* or *spectator*' (Chion 2009: 468).

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the city, producing a fast-cut,[101] disorienting audiovisual narrative. It treats of urban

telecommunications systems, security, law enforcement, traffic, public transportation,

recycling, road maintenance and the movement of people.

Within this sequence of fleeting images of the city he incorporates a number of

photographic glitches, such as coloured lens flares[102] and excessive colour grading,[103]

which emphasise the necessary agency of the camera, and of postproduction

processes, in the video. These glitches subvert photographic conventions that evolved

in order to attempt to preserve a presumed naturalistic presentation of real world

objects and beings, for which photography and later, film technologies, were initially

championed.[104]

In addition to those photographic glitches, *Glitch* also features glitches that

subvert the conventions of audiovisual narrative. These conventions evolved in an

attempt to further preserve naturalistic presentation through shot-matching

conventions – the 180° rule,[105] for example – and continuity editing.[106] These

structural glitches comprise jump cuts,[107] inverted imagery, crash zooms,[108] whip pans

and tilts,[109] visual repetition and the reversal of time. Each creates a jarring transition

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[101] Fast cutting is a type of audiovisual editing technique that concatenates several consecutive shots, each of very brief duration.

[102] A lens flare is created when non-image forming light enters the lens of the camera and subsequently hits its digital sensor.

[103] Colour grading is the process of altering and enhancing the colour of an image, either electronically, photo-chemically or digitally.

[104] See, in particular, mid-20th century film theory: André Bazin, 'The Ontological Realism of the Photographic Image' (1945); Maya Deren, 'Cinematography: The Creative Use of Reality' (1960); Siegfried Kracauer, *Theory of Film: The Redemption of Physical Reality* (1970); Stanley Cavell, *The World Viewed: Reflections on the Ontology of Film* (1979).

[105] The 180° rule governs the on-screen spatial relationship between a character and another character or an object within a scene, for example.

[106] Continuity editing was developed in order to elide the inherent discontinuity of the editing process and to establish a logical coherence between shots.

[107] A jump cut is a type of audiovisual editing technique in which two sequential shots of the same subject are taken from camera positions that vary only slightly in orientation or focal length.

[108] A crash zoom is an in-camera visual technique wherein the camera zooms in very rapidly on a subject.

[109] Whip pans or tilts are in-camera visual techniques whereby the camera moves very rapidly following a horizontal or vertical trajectory.

from one image to the next, which accumulate to produce an unconventional and disorienting audio-viewing experience.

These various visually articulated structural glitches are echoed in the video's soundtrack that comprises a variety of discordant, mechanical sounds (reminiscent of industrial or glitch music),[110] which are foregrounded in the video. This thereby subverts the conventions of audiovisual soundtrack whereby music is typically de-emphasised as an underlying, background sound. Thus, the variety of glitches in this video formally emphasise its mediating technologies and the established conventions of their use or operation.

In *HARDCORE_GLITCH* LePôLe takes the formalisation of glitch to its extreme, wherein the human faces and bodies that can be inconclusively discerned on-screen are formed entirely through glitch. He models human beings through exaggerated pixels – arguably one of the most familiar glitches to the natives of digital culture. The pixellated appearance of these human beings characterises the video's visual style. LePôLe further emphasises the extreme pixellation of these images by over-saturating their colour and setting them against a black background, from which they consequently stand out.

The video's soundtrack echoes its glitch-laden visual style, being similarly laden with a variety of sonic glitches. It incorporates glitches that sonically model compression artefacts, codec[111] errors, aliasing[112] (whose visual counterpart produces pixellation) and distortion, producing a soundtrack that is akin to glitch music. It provides the driving rhythm according to which the images are edited together,

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[110] Industrial music is an experimental style of music that incorporates industrial sounds to produce sonically transgressive compositions.

[111] A codec is a computer programme or device that is used to encode or decode a digital data signal or stream.

[112] An inadequate sampling bandwidth creates an alias, a sonic artefact that distorts the sound being digitally reproduced. See the Nyquist–Shannon sampling theorem.

producing a rapid audiovisual sequence of pixellated human beings and distorted sounds.

The combination of a variety of visual and sonic glitches in this video suggests that the operational limits of the digital technologies involved in its production or presentation/streaming have been transgressed in a number of ways. This formally emphasises the means, and thereby, the fact of the video's mediation.

3.3   Glitch and technology

The glitches in *floW*, *Glitch* and *HARDCORE_GLITCH* relate to the digital technologies of their production according to a variety of, but nonetheless related, formal strategies. As a result, these videos demonstrate the scope of technologically centred issues that the glitch formally articulates. The following technologically informed analysis of the glitches in the videos elucidates their relationship to the technologies that underpin the digital arts and online space.

The analysis employs a theoretical model that exploits existing scholarship that has engaged the technological and experiential specificities of digital mediation, the ontology of the glitch and the principles of media convention. In 'Glitch Aesthetics' (2004) Iman Moradi elucidates the technological ontology of the glitch, providing a useful model against which I consider its formal significance. Menkman's technocultural analysis of the glitch in *Network Notebooks 04: The Glitch Moment(um)* (2011), illuminates the technological and experiential implications of the glitch as formally articulated in the videos studied. Fiske's conceptual model of media convention, in his *Introduction to Communication Studies* (1982), informs my theory of photographic and structural glitches. Binkley's early digital media arts research usefully theorised the opacity of data in optimally operating digital technology in 'Digital Dilemmas' (1990b) and 'The Vitality of Digital Creation' (1997), providing a theoretical model against which I consider its formal articulation through glitch.

Despite the formal variation of glitches in the videos, the 'dropped frames' glitch and those that distort the image in *floW*, the photographic and structural glitches in *Glitch*, and the visual pixellation and sonic glitches in *HARDCORE_GLITCH,* all indicate an absence of the expected functionality of their technologies. *floW* combines an authentic glitch that occurred in its digital video file

and contrived glitches that suggest a number of errors in the media player that streams the video. The sonic glitches in *Glitch* suggest that errors have occurred in the technology underpinning the soundtrack, whereas the visual glitches call attention to mediation by subverting the established conventions of photography and audiovisuality. The visual and sonic glitches that dominate *HARDCORE_GLITCH* overtly stress the technologies of mediation that underpin it. Through their formalisations of glitch, these videos draw attention to the fact of their digital mediation.

The initial 'dropped frames' glitch and the distortion, pixellation and other degenerative glitches that corrupt *floW* articulate a number of errors in the digital technologies that underpin the video.

The vacillating test card at the beginning articulates the loss of a number of frames from the original digital video file. As v5mt explain: 'Glitches in the begining [*sic*] (missing frames) come from *AE* [*After Effects*][113] render'.[114] The subsequent glitches suggest that the digital system's ability to effectively reproduce the digital video file has been impeded by insufficient data, that the data has been corrupted in some way, or, that an error has occurred in the production or streaming technologies.

According to an extant scholarly discourse on digital glitch,[115] there is an important ontological distinction between the first and subsequent glitches of the video. The initial 'dropped frames' glitch can be categorised as a 'pure glitch', after Iman Moradi, or, 'an unpremeditated digital artefact' of technological malfunction,

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[113] *After Effects* is a digital motion graphics, visual effects and compositing software package.
[114] V5mt 'floW on Vimeo', http://vimeo.com/20247975, accessed 04/09/2011.
[115] See, in particular, Barker: (2011); Briz: (2011); Cates: (2011); Cloninger: (2011); Kelly: (2009); Krapp: (2011); Mako Hill: (2011); Moradi: (2004); Nunes: (2011); Piper Burns and Meaney: (2011); Sangild (2002), (2004a), (2004b).

whereas those that follow correlate to Moradi's 'glitch-alike', which he describes as 'a collection of digital artefacts that resemble visual aspects of real glitches found in their original habitat' (2004: 9; 10).

As v5mt stated, the initial glitch of the video was produced by the loss of frames in the *After Effects* rendering process. However, they deliberately produced all of the other glitches that appear in the video using *Processing*.[116] The ontology of the pure glitch is vital for our understanding of glitch and of the issues that it draws into the audiovisual narrative: the expected functionality of technology, mediation and media conventions.

The ontological distinction that Moradi – *inter alios* – makes between the authentic and the contrived glitch, illuminates the formal significance of glitch. His 'pure glitch,' in which a digital technology has genuinely malfunctioned, evinces a strong theoretical link between the occurrence of an error in a technology and the formal manifestation of that error. It thus importantly highlights the formal significance of glitch that is specific to, and thus, expressive of the technology involved.

Despite the distinction that Moradi and others would likely stress between the first (authentic) and subsequent (contrived) glitches that appear in *floVV*, the formalisation of such glitches is not contingent on ontological veracity. It is not possible to perceive the ontological veracity of a glitch because as Moradi points out, 'glitch-alikes' resemble authentic glitches. The contrived glitch simulates the formal features of the authentic glitch, so that they are formally indistinguishable. Whether indicating a genuine fault in the technology involved, being found or deliberately produced, the glitch formally articulates its underlying digital technologies.

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[116] *Processing* is an open source programming language and integrated development environment.

In either case, the glitches in *floW* (as is also the case in *Glitch* and *HARDCORE_GLITCH*) draw attention to the technologies that underpin the video by making them formally explicit in the video's narrative. They formally introduce the marks of the digital technology involved, through authentic, and contrived distortion, pixellation and other degenerative glitches, and with these glitches, the notion of technological virtuality is introduced to the video's narrative. The video thereby makes explicit those aspects of digital technology that Slouka, writing in the early period of digital culture, identified as central to what he discovered at the time as a digital transformation of our social, cultural and political selves.

By asserting the abstract nature of the objects that appear in the video, through a number of different types of glitches that formally refer to the underlying technology that mediates them, the video formally articulates the central concern of his thesis (1996a; 1996b). In his writing, he identified an increasing readiness with which people of the mid-1990s would accept abstractions for the real thing. Correspondingly, he highlights a key paradox at the centre of a burgeoning digital culture - the fact that when we engage with the digital network we are in fact engaging with a 'scheme that is designed to sell us copies of the things we already have available to us for free - life itself' (Slouka 1996b: 32). The formal construction of *floW* emphasises the fact that everything we see in the video - and correspondingly, all of the places, spaces, communities, cultural objects, texts, and so on, that we engage with on the network - is a virtual copy of a thing in the world, rather than the 'real' thing itself.

The glitches in *Glitch* subvert the conventions of photographic imaging and audiovisuality, foregrounding the technological apparatuses and processes that mediate this audiovisual narrative. Soderberg echoes this abundance of visual glitch

with an abundance of sonic glitches that comprise the video's soundtrack. These glitches illustrate a broader concept of error than those in *floW*.

Whereas *floW* incorporates glitches that model malfunction in the technologies that underpin the video, the glitches in *Glitch* subvert the established conventions of photography and audiovisuality. As with their functional counterparts, such structural glitches articulate malfunction by subverting these conventions to which we have become accustomed and have internalised as a consequence of their cultural pervasiveness.[117]

Rooted in Shannon and Weaver's scientific analysis of communication noise (1971), Menkman theorises the technological and experiential significance of glitch as an:

> (actual and/or simulated) break from an expected or conventional flow of information or meaning within (digital) communication systems that results in a perceived accident or error. A glitch occurs on the occasion where there is an absence of (expected) functionality, whether understood in a technical or social sense. Therefore, a glitch, as I see it, is not always strictly a result of a technical malfunction. (2011: 9)

Glitch combines both the technical and social implications of the glitch that Menkman describes. On the video's soundtrack, sonic glitches model malfunction in the technology involved and thereby formalise the technological significance of the glitch that Menkman describes. The structural glitches in the video's image track (lens flares, excessive colour grading, jump cuts, inverted imagery, crash zooms, whip pans and tilts, visual repetition and variable temporality) subvert our expectations of the function and conventional use of the technology involved. They thus formalise the experiential implications of the glitch identified by Menkman.

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[117] Recall Scott McQuire's analysis of the audiences' internalisation of the visual conventions of photography that became the hallmark of credibility in digital imaging (2000: 49), discussed in chapter 1 of this thesis.

Fiske's theory of convention elucidates the photographic and structural glitches that I have identified in *Glitch*. Referring to Shannon and Weaver's concept of redundancy, which: 'helps overcome the problems of transmitting an entropic message' (Fiske 1984: 12),[118] he describes how the accuracy that we ascribe to media messages is determined by our prior experiences of similar message forms. For him, '*Convention* is a major source of redundancy, and thus of easy decoding' (*Ibid.* 11). Accordingly, we can understand *Glitch*'s subversion of the formal conventions of imaging and audiovisuality as photographic and structural glitches.

The glitches that dominate *HARDCORE_GLITCH* articulate a further formal nuance of the glitch in audiovisuality. Rather than appearing to be corrupted by glitch (*floVV*), or appearing to be erroneously produced and constructed (*Glitch*), *HARDCORE_GLITCH* is modelled *entirely through* glitch. The distortion that characterises the video's sounds and images suggests that the technology involved has insufficient data to accurately reproduce the sounds and images that were originally recorded. Being contrived, rather than authentic, such glitches are 'an approximation of what originally would have been the materialization of a destabilizing break of machine technology' (Menkman 2011: 49). In this way, these glitches formally emphasise the digital technologies that underpin the video.

Asserting the technological specificity of the early digital media arts, Binkley noted that computers 'communicate to us what numbers they are "thinking" about by converting them into tokens we can use,' where the '"what" and "how" of virtual creation are intimately linked through the formal mathematical structures that define them both' (1990b: 14; 18). In a later essay, he added: 'There is no transparent screen between numbers and pictures. The computerized connection between them is

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[118] Fiske defines entropy as 'maximum unpredictability' (Fiske 1984: 11), and Menkman defines entropy as 'the measure of disorder of a system at a given time' (Menkman 2011: 13).

recondite and the numbers themselves remain reclusive' (Binkley 1997: 113). His theorisation of the dual structure of digital communications, coupled with that of the typical opacity of the data underpinning such communications, enables us to understand the formal construction of *HARDCORE_GLITCH*.

In optimally functioning digital technology the dual aspects of digital communications typically remain distinct. For example, the human sees the digital image and the computer 'sees' the data that underpins it. *HARDCORE_GLITCH* subverts the typical parallel operation of digital communications that Binkley describes. In this video, the 'how' of its production and/or streaming – the digital data processes underpinning it – are articulated within the 'what' of its audiovisual narrative. The abundance of glitches in the video, in which they form part of all of its visual and sonic elements, formally asserts the digital technological processes that underpin its production and/or streaming.

3.4   Conceptual implications of the glitch

Considering the conceptual significance of the glitch, Menkman asserts how it 'has become a new mode; and its previous uncanny encounter has come to register as an ephemeral, personal experience of a machine' (2011: 31). As she points out, our habitual interaction with the pervasive technologies of digital culture engenders a conceptual engagement with their specificities. Thus, Menkman does not suggest that the glitch alone is a completely new formal or aesthetic feature of creative practice - as we have seen throughout his chapter, noise arts practices (of which glitch forms part) have been engaged at least as early as the beginning of the twentieth century. Rather, what she deems new is the context within which such noise or glitch practices operate, aesthetically, technologically, culturally and politically. Because these contextual features of arts practices are in a constant state of flux, the conceptual implications of our 'personal experience' of the digital machine are renewed by its changing technocultural context. In this way, the conceptual implications of the glitch in *floW*, *Glitch* and *HARDCORE_GLITCH* relate to the experiential, cultural, political and social specificities of digital technology in the contemporary cultural period.

The following analysis of the glitch in these videos employs a theoretical model that draws on scholarship concerning the inherent qualities of media technologies and their consequent conceptual implications. Holtzman's suggestion in *Digital Mosaics: The Aesthetics of Cyberspace* (1998), that the essence of digital technology could be perceived in the transgression of its operational limits, establishes the technological roots of the conceptual significance of the glitch. In *Network Notebooks 04: The Glitch Moment(um)* (2011), Menkman usefully expands the scope of that significance. Fiske's theory of the purpose of convention in

Introduction to Communication Studies (1982) provides a productive model against which I establish the communicative capacity of the glitch. In an interview with Professor John Armitage[119] in 1999: 'From Modernism to Hypermodernism and Beyond' (2001), Virilio usefully identified the potential for error that exists in all technological inventions. In 'Error, Noise, and Potential: The Outside of Purpose' (2011), Mark Nunes' 'poetics of noise' helpfully illuminates the conceptual practice of glitch art.

Mitchell Whitelaw deemed the art of audio glitch, 'acutely self-conscious' (2001: 49). The selection of videos analysed here demonstrate how the glitch is a similarly self-conscious feature of audiovisuality. In other words, they show how it conceptually implicates the specificities of digital technology in the narrative of the video. The glitches in *floW* conceptually implicate the digital data that underpins it and consequently, the processes of mediation that are central to arts practices. The functional and structural glitches that populate *Glitch* emphasise both the expected function and conventional use of its underlying technologies in their transgression of its operational limits and of the conventions of photography and audiovisuality. The abundant glitches in *HARDCORE_GLITCH* critique the ideology of error-free digital technologies that underpins digital culture. These conceptual implications of glitch extend beyond purely technological operations, but nevertheless develop from those operations.

Of course, noise practices (used here as a general term that covers a wide range of creative practices employing noise and glitch) are always necessarily, to some degree, self-referential of the arts practices and media technologies according to which they are brought to the public consciousness. In earlier scholarly studies of the

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[119] Professor John Armitage is Professor of Media Arts at the Winchester School of Art in The University of Southampton, United Kingdom.

subject of noise practices, at the turn of this century, their realm of significance would typically be termed postmodern, where the medium or technology involved is used to foreground the very involvement of that medium or technology in the processes of mediation. In this sense, I do not intend to imply that digital glitch is the first or only self-referential device to have emerged from audiovisual practice - an entire study could be devoted to a critical historiography of such practices throughout the history of audiovisuality. For example, in the mid-twentieth century experimental film and video makers like Michael Snow, Hollis Frampton, Tony Conrad and Paul Sharits produced what the film theorist P. Adams Sitney contemporaneously termed 'structural film' (1974). Structural film employs devices that are designed to demystify the filmic process - in other words, to show the materiality of film in order to emphasise the necessarily constructed-ness of the film image. Structural film practices, therefore, could similarly be described as self-conscious features of audiovisuality.

Like structural film devices, the glitches in the videos currently under discussion are also referential to the technologies of their mediation. However, the mediating technologies to which structural films or glitch audiovisual practices refer are fundamentally opposed to each other. The film and video technologies with which Snow, Frampton, Conrad and Sharits were working in the 1960s and 1970s were analogue technologies, whereas digital video is rooted in binary data.[120] Therefore, the formalisation of the medium in each case results in on-screen features that are specific to the particular technology that mediates the audiovisual work. An important difference between self-referential practices in structural film and those in glitch video emerges in terms of the conceptual field to which each practice refers.

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[120] See Appendix.

Film as a medium supported a markedly hermetic media practice that was largely devoted to entertaining and/or informing the public. Cinema was a circumscribed industry, linking film studios, distribution agencies, cinema houses and the cinema-going public. By contrast, in the contemporary world digital data has an unprecedented reach into our social, cultural, and political lives. This striking distinction between the socio-cultural relevance of the film industry, against that of the digital network from which digital audiovisuality has emerged, informs the formal, conceptual, and narrative significance of the glitch in *floW*, *Glitch* and *HARDCORE_GLITCH*. Consequently, the conceptual field that is implicated by glitch practices that assert the digital-ness of the work, includes, but importantly also reaches beyond, our means of entertainment and information, to involve so many of the ways in which we now live our lives. The following discussion shows how the conceptual implications of the glitch in the videos studied relate specifically to the technocultural context of the current period of digital culture.

Through glitch, the videos formally assert the necessarily implicated, but often elided, agency of the digital technologies that underpin their images featuring the objects, beings and places of the lived world. Glitch allows the audio-viewer to see and hear the fundamental virtuality of each of the on-screen elements and sounds that make up the video's diegesis. Only through their malfunction can we really begin to recognise the digital technologies that are typically hidden from us, but are no less implicated in, our everyday lives as natives of digital culture. Through glitch, these videos formally emphasise what Holtzman considered to be the essence of the digital - its technological, experiential, social, political and cultural specificity - by introducing its distinct and recognisable form to the audiovisual narrative.

Menkman saw the glitch as a means to critique the medium, to draw attention to its 'materiality' in order that the medium could then be subject to deeper analysis. Her analysis critically attends to the glitch as the formal articulation of the digital medium, which she considers in terms of the virtual constant that permeates so many aspects of our lives, and as a necessarily political entity whereby we perform our social and political selves (Menkman 2011). The glitch infiltrates the narratives of the videos under discussion, which comprise themes concerning the mediation of cultural practice, engagement and heritage; the ideologically asserted conventional operation of digital technology, and the transgression of that operation; and the conventions governing the operation and typical use of other media technologies that have developed throughout the history of the media arts. In this way, they are formally, conceptually and narratively discursive of the cultural, psychological, social and political implications of digital technology that have been detailed by digital theorists and critics such as Jeremy Rifkin, Sherry Turkle and Mark Slouka.

The analysis of videos that follows traces those conceptual implications of digital technologies that have been identified and established by critical interventions into digital culture - such as those made by Rifkin, Turkle and Slouka - and which have been introduced to their audiovisual narratives by their various formalisations of the glitch. Those conceptual implications of digital technology that the glitch brings to light in the videos' narratives have developed from our habitual engagement with such technologies throughout the practice of contemporary culture, society and politics. The theorists whose work informs the following analysis have argued in their own research - and indeed, this concept has been pivotal to the broader field of digital media arts scholarship - that these conceptual implications have developed from our engagement with the technological specificities of digital media and with

their technological structures which, in turn, structure and thereby influence many of the cultural, social and political institutions, communities and experiences of digital culture. The following analyses of *floW*, *Glitch* and *HARDCORE_GLITCH* demonstrate how these conceptual implications of digital technology are drawn into audiovisual narrative through the manifestation of glitch. In brief, these implications have been engendered by the new spaces of social, political and cultural practices that digital technologies have introduced to the world through the digital network and are rooted in its unprecedented power to link people and communities in the practice of culture. Central to all of this, of course, is the unavoidable but largely overlooked fact of technological error and breakdown that threatens the democratising potential of the digital network.

The type of glitches that distort, pixellate and degenerate the images in *floW* are identified by Menkman as those which result from the digital technological process of data bending.[121] These glitches appear to inhibit a potentially seamless presentation of the video, subverting the 'expected functionality' of the digital technology involved (Menkman 2011: 9). In so doing, they draw the conceptual implications of the glitch – the expected functionality of its underlying technology and thus, its means of mediation – into the video. These visual glitches suggest that the technologies involved in presenting the video – the effects rendering engine and the online video player – are malfunctioning. Thus, each of these visual glitches explicitly refers to the underlying technologies of the video's production and distribution/streaming.

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[121] Rosa Menkman, 'A Vernacular of File Formats: A Guide to Databend Compression Design' (2010), http://rosamenkman.blogspot.com/2010/08/vernacular-of-file-formats-2workshop.html, accessed 13/10/11.

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As a contemporary reworking of the theme of René Magritte's *La Trahison des Images* [*The Treachery of Images*] (1928-9),[122] the glitches in *floW* similarly emphasise the processes of mediation that are fundamental to artistic expression, from the classical Greek sculpture to the 1990s rave/acid house iconography featured in *floW*, and indeed, the video itself. As with Magritte's painting, in which the mediated image and the mediation of that image are conceptually bound, so in *floW* the technological processes that mediate these images are formalised through glitch and so, form an essential aspect of its audiovisual narrative.

In his prescient work, *Digital Mosaics: The Aesthetics of Cyberspace*, Holtzman deemed 'abstract representation in binary form' the essence of the digital media, later pointing out how 'embracing the constraints of the digital' can define its aesthetic (1998: 129; 152). For him, the digital aesthetics that a nascent cyberspace had begun to reveal were founded in the unique aptitude of digital media technologies to formally express ideas that pre-digital media were incapable of expressing. It is important to clarify the scope of Holtzman's concept of the expression of ideas that he argues are specific to digital media. Rather than suggesting that the manner in which glitch draws attention to the agency of the technology involved, and to the processes and apparatuses of mediation, is exclusive to digital technology - and following a similar conceptual trajectory to Holtzman in his research - my analysis similarly considers the contextual significance of such media practices in relation to the specific cultural-political period from which they emerge.

Of course, we can look to a range of media and performance practices that pre-date the digital period and find examples of similarly discursive practices, albeit ones whose conceptual significances are - importantly - specific to the particular

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[122] Magritte's celebrated painting of a pipe with the subtitle "Ceci n'est pas une pipe", emphasised that his painting was not a pipe, but rather, a painting of a pipe. For further analyses of the painting, see: Patricia Allmer, *René Magritte: Beyond Painting* (2009).

creative practice and cultural period that bore them. For example, in literature, we can find similarities between the discursiveness of the glitch and the metafictional[123] techniques of writers such as Cervantes, Laurence Stern, Flann O'Brien, Robert Coover and Italo Calvino. Also, in historic audiovisual practice, we can find similarities between the discursiveness of the glitch and the metacinematic [124] techniques used by filmmakers such as Vertov in *Man with A Movie Camera* (1929), Federico Fellini in *8½* (1963), Jean-Luc Godard in *Le Mépris* (1963), Tom DiCillo in *Living in Oblivion* (1995), or Michael Winterbottom in *A Cock and Bull Story* (2006). In theatre also, in the early twentieth century, Berthold Brecht's concept and practice of the 'estrangement effect' was employed to discourage a willingness to suspend disbelief and to distance the theatre-goer from the emotions and characterisations of the play, in order that they could instead adopt a role of critical interrogation of the play. Similar processes can be found later in the work of dramatists and theatre directors, such as Augusto Boal, Joan Littlewood, Peter Brook and Máiréad Ní Ghráda.

Similar to Holtzman's analysis of the digital arts, the current study considers the culture from within which the ideas that engender particular digital arts practices emerge, in relation to their articulation in the final artwork. This coherent concept of arts practice, considered from its initiating cultural context to its final expression in mediated sensory phenomena, underlies and informs the current project of analysis, which considers the cultural context of the ideas that emerge from our use and habitual engagement with digital technologies characterising the contemporary period. As with Holtzman's work, in this study, the mere unconventionality of the online

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[123] The term 'metafiction' refers to a range of literary devices that parody or depart from novelistic convention in order to self-consciously and systematically draw attention to the literary work as artefact.

[124] The term 'metacinema' refers to the use of a range of filmic techniques whereby the story of the making of the film is incorporated into the film's narrative.

videos under examination is not as interesting or critically fruitful as how their unconventionality formally, conceptually and narratively articulates the technocultural specificities of contemporary culture. The following analysis considers the specificities of digital technology from the particular influence that it has on our lived experiences, which inspires the production of the videos that are under discussion throughout this thesis and whose unconventional construction has, in turn, been practically facilitated by the specificities of their underlying technology.

In his book, Holtzman delineates a reciprocal relationship between the particular aptitudes of digital technologies and the new experiences of immersion and interactivity that cyberspace had introduced to 1990s culture. By exploiting the constraints or operational limits of digital technology and formalising the transgression of these limits within the frame, the glitches in *floW* articulate the 'essence' of the digital that Holtzman describes.

While the glitches in *floW* conceptually implicate the function of its underlying technologies, those in *Glitch* conceptually implicate both the function, and the conventional use, of that technology. Incorporating functional glitches (on the soundtrack) and structural glitches (in the visual track), *Glitch* reveals their similar conceptual operation in its audiovisual narrative.

The functional glitches in the video's soundtrack emphasise the technological means of its mediation. Menkman argued that the glitch 'reveals itself to perception as accident, chaos or laceration and gives a glimpse into normally obfuscated machine language' (2011: 29). Accordingly, we can appreciate how, by formalising the underlying technology, these glitches draw these conceptual implications of the glitch into the video's narrative. Menkman adds: 'Rather than creating the illusion of a transparent, well-working interface to information, the glitch captures the machine

revealing itself' (*Ibid.* 30). The digital technological processes underlying *Glitch* are revealed through its sonic glitches.

Subverting the conventions of imaging and audiovisuality, the video's structural glitches also draw our attention to the agency of the technology involved by perverting our expectations of its use due to those conventions. Fiske states: 'A writer who breaks with convention does not want to be easily understood: writers who desire easy communication with their readers use appropriate conventions' (1984: 11). Despite the questionable polarity of his statement, his theory of the motivation of media conventions is nonetheless revealing of the conceptual implications of the structural glitches in *Glitch*. Whereas Fiske allies convention with ease of communication, I would argue that the structural glitches in *Glitch* allows us to perceive – and so, communicate – the conventions of the use of the technologies of production, through their subversion.

The glitches through which *HARDCORE_GLITCH* is entirely modelled sonically and visually articulate the inability of the digital data involved to effectively reproduce the images and sounds that LePôLe originally recorded. Those glitches thereby conceptually convey the potential inability inherent in all digitally based systems of communication to accurately reproduce lived world phenomena or, as Shannon and Weaver asserted, media messages.

Virilio termed this potential the 'integral accident' – an unavoidable aspect of any technological invention – whereby 'every time a technology is invented [...] an accident is invented together with it' (Armitage 2001: 32). The ideology of digital technologies in contemporary culture as largely error-free machines capable of replacing human beings in an increasing range of tasks, and of seamlessly intervening in our social and cultural engagements, omits this intrinsic aspect of its underlying

technologies. The glitches in *HARDCORE_GLITCH* emphasise, and so, conceptually convey this necessary aspect of digital mediation.

Mark Nunes's 'poetics of noise' describes the intentional subversion of the optimal and expected function of digital technologies – as in *HARDCORE_GLITCH* – to critique the dominant ideology of digital culture. In order to do so, it 'foregrounds the creative potential of the errant and the unintended outcome – a purpose that has no purpose within an existing (actual) system of meaning or order' (Nunes 2011: 16). Viewing *HARDCORE_GLITCH* from the perspective of Nunes' theory, we appreciate the conceptual significance of its glitches. By modelling the objects and beings depicted in this video through glitch, LePôLe formally merges the concept of technological error with them. Through this poetics of noise he emphasises that which exists, ideologically, on the fringes of digital media technologies, but whose presence impacts contemporary digital culture.

Of course, throughout the history of the media arts, the creative potential of noise - in its many and varied guises before the digital glitch - has been harnessed in a variety of arts practices as a means to foreground a number of interrelated concepts discursive of and relating to art, in the work of art. This history illustrates the breadth of variation that exists among noise arts practices, from the music performed by noise bands like the Nihilistic Spasm Band, who played their heavily improvised music on modified and home made musical instruments unencumbered by musical convention, such as tempo and time signature, to filmmakers such as Norman McLaren, Len Lye, David Rimmer and Al Ruzutis who applied unconventional and destructive techniques to the filmstrip.

Implicated in wide-ranging noise art practices are similarly various impulses of critical practice: to draw attention to the technological apparatuses that underpin

these practices, and thereby, their processes of mediation; to politicise the technologies of mediation by bringing them to the public consciousness through art; to draw attention to the conventions that underpin these practices in order to critique their cultural-political operation, involving the promotion of the ideologies of particular social groups, political entities, or corporations, and so on. Equally, we can find a breadth of variety among the philosophies that underpin such practices, or are critically allied to them through scholarship, laid out in academic treatises ranging from the Luigi Russolo's *The Art of Noises* (1913) to Greg Hainge's *Noise Matters: Towards an Ontology of Noise* (2013). Just as the conceptual and philosophical implications of arts practices are contextual to the cultural-political environment from which they emerge, the critical analysis of such practices is also necessarily the product of its cultural-political context.

The creative practice of noise subverts the conventional operation or use of media technologies, thereby encouraging inquiry into the technological, cultural, social and political dimensions of the mediated arts that employ noise. The use of glitch in the three videos analysed in this chapter are specific to their underlying digital technology in that they manifest some aspect of that technology through pixels, the deterioration of the image, the shuddering image of a corrupted digital video file, and so on. Moreover, these manifestations of the technology involved draw associated conceptual implications into the videos' narratives that derive from our relationship with, and experiences of, that technology, which pervades so many aspects of contemporary digital culture. In this way, the poetics - after Nunes - of the glitch in those videos, or the conceptual implications of their formal emphasis on the videos' underlying digital technologies through the subversion of their optimal

operation, models the failure of technology that has no purpose within the ideology of digital culture.

The cultural, social and political benefits that have been attributed to the development of digital technologies since their inception, turns on a key ideological perspective - all of the ways in which digital technology will enhance or change life on earth are necessarily contingent on its full, optimal and reliable operation. However, much of vernacular and critical discourse continues to focus on the veracity of such claims in the name of technology to betterment, social emancipation, political and cultural freedom, and so on, neglecting this central and salient point that underpins the whole of contemporary digital culture. The glitches that appear in *floVV*, *Glitch* and *HARDCORE_GLITCH* are discursive of the real threat to any hope of the emancipation, political empowerment and betterment of society through the digital network, which is founded upon a technology in which the potential for error is necessarily implicated. By creatively employing glitch, these videos formally, conceptually and narratively assert this central fact of digital culture in order to interrogate the conceptual foundation of its dominant ideology - that of the infallible and error-free digital machine.

3.5   Glitch narrative

Discussing the contextual significance of glitch in music composition, Sangild pointed out how: 'Noise in music is usually an element in an overall musical gesture and takes its meaning in relation to this gesture. This does not mean, of course, that noise can express anything. Noise adds specific meanings to the gesture in which it partakes' (2004a: 4.1). Recognising the contextual significance and the conceptual scope of the glitch, which produces meaning based on its interaction with the musical narrative, or to use his terminology – the musical gesture – Sangild's theory of glitch music elucidates the narrative role of the glitch in *floW*, *Glitch* and *HARDCORE_GLITCH*. The interrelation of the inherent and technological specificities and the conceptual implications of the glitch with the subject matter of those videos, produces narratives that relate the conditions of contemporary digital culture.

In order to attend to the conceptual complexity of the narratives of these glitch videos, I employ a theoretical model that exploits existing research into the narrative operation of the glitch and into the scope of conceptual implications that it introduces to media narratives. The analysis appropriates Sangild's theory, in 'Noise - Three Musical Gestures - Expressionist, Introvert and Minimal Noise' (2004a), of the narrative operation of the glitch in glitch music. In his interview with Professor Armitage (2001), Virilio's assertion of the goal of criticism in the technological arts illuminates the glitch narrative. Meaney's 'On Glitching' (2010b) usefully theorises the dual significance of the glitch in video narrative. Invoking Fuller's concept of media ecology (2005) in 'Datamoshing and the Emergence of Digital Complexity from Digital Chaos' (2012), William Brown and Meetali Kutty usefully establish the conceptual significance of the glitch-saturated digital practice of datamosh. Hainge in

Noise Matters: Towards an Ontology of Noise (2013), helpfully identifies the advanced capacity of digital technologies to conceal the degree of error that necessarily forms part of them.

The interaction of glitch with the images of a history of Western visual culture in *floVV* produces a narrative that relates how our access to our shared cultural heritage and indeed, to contemporary culture, is increasingly mediated through digital technologies. In *Glitch* the interrelation of functional and structural glitch with the images of urban life produces a narrative that relates how the systems that underpin urban spaces and so, mediate urban life, are mediated by fallible technologies. The formal melding of glitch with the human beings that feature in *HARDCORE_GLITCH* produces a narrative that highlights how our engagement with the digital network, and with each other through that network, involves a digitised version of our selves. This glitch narrative emphasises the inherent fallibility of digital technologies and their imprecision when reproducing the human being.

The glitches in *floVV* articulate error in the video's digital file and in the streaming technologies that facilitate its online distribution and reception, thereby drawing the conceptual implications of these features, concerning various aspects of mediation, into its audiovisual narrative.

Adapting Sangild's theory of the contextual significance of the glitch for audiovisual narrative, we can appreciate how the narrative operation of the audiovisual glitch is contingent on the context within which it appears. Keeping the 'dropped frames' glitch that genuinely occurred at the beginning of the video and incorporating the other contrived glitches that follow it, v5mt incorporate the manifestation of digital technology, both by reference to the digital file and to the

digital technological system that runs that file, into *flo\/\/*'s audiovisual narrative. Through glitch, the video interrelates the technological means of the video's mediation with its images that refer to the history of visual culture.

Interrelating glitches with a sequence of such images, *flo\/\/*'s narrative enables us to perceive its mediating technology in the context of visual culture. This emphasises the fact of their mediation. Given the digital specificity of those glitches and of the video itself, the glitches that corrupt v5mt's sequence of images of a history of visual culture enable us to perceive how our shared cultural heritage is similarly mediated by those technologies. Our access to contemporary and historic media arts: music video, television programming, music, film, animation, and other sonic, visual and audiovisual arts, largely takes place through the Internet, accessed using laptops, tablets and smartphones, for example. All such media arts are stored on databases, which we access through search engines and listen to/view/audio-view using various media-streaming interfaces.

The glitches in *flo\/\/* emphasise, through the technological degeneration of the image, the digital processes of mediation that underpin its images. This narrative relates the technological intervention in visual culture and cultural heritage in the digital age. The video's glitches articulate the specificities of contemporary culture, which is likewise increasingly mediated through digital technologies. By formally interrelating glitch and the history of visual culture on screen in this way, *flo\/\/*'s audiovisual narrative communicates how our access to, and our participation in, our shared cultural heritage depends on digital technologies.

Akin to the formal analogy that the narrative of *flo\/\/* sets up between digital technology as the mediator of the video and as the mediator of our cultural heritage, Soderberg's use of glitch in *Glitch* makes a similar analogy between digital

technologies that mediate the video and those that mediate urban life. Formally interrelating glitches that suggest the failure of the technology underpinning the video with images that model various systems that underpin and facilitate the operation of urban spaces, the video's narrative articulates the potential for error in these urban systems. In addition, Soderberg's construction of these images through structural glitch produces jarring visuals and ruptures in the conventional flow of audiovisual narrative. Modelling its images of urban systems in this way, the video further draws attention, through the subversion of the conventional operation of its technologies, to the potential subversion of the conventional operation of technologically rooted urban systems.

Virilio has pointed out the necessary symbiosis of potential function and malfunction in all technological inventions, despite the ideologies that have grown up around them. As a result, he states: 'As an art critic of technology, I always try to emphasize both the invention and the accident. But the occurrence of the accident is being denied. […] The hype in favour of technology dismisses its negative aspects' (Armitage 2001: 32). Thus, we can recognise a similarity between Virilio's critical practice and Soderberg's creative practice in this video. *Glitch*'s narrative relates this fundamental potential for error that digitally mediated systems necessarily comprise. By formally constructing his video in this way, Soderberg emphasises the often-overlooked systems that are at work within urban spaces. His complex use of both technological and structural glitch draws our attention to the risk of failure that is inherent in the technologies that underpin the operation of urban life and to the opacity of these systems in their conventional operation, which renders them seemingly innocuous.

Meaney states that glitching: 'is an attempt to integrate the 'nebula' of video with a concrete process of interpretation and injunction, thereby incorporating the properties of a medium into the narrative of its content. [...] every file is telling a dual story, one of its accessible presentation and one which is only apparent as its internal systems, its code, become visible' (2010b: 46). Accordingly, we can appreciate the narrative operation of the glitch in *Glitch* as the interrelation of these two aspects of its narratives: the technological systems that underpin the video – articulated by functional and structural glitch – and the images of urban systems that these glitches invade. Through structural glitch it analogically reveals the systems at work throughout the city and through functional glitch it highlights the technological precariousness of those systems in which we implicitly place our trust.

The narrative implications of the glitch are therefore discursive of a central concern in digital media scholarship - one whose later impact was presciently anticipated by Slouka (1996a; 1999b). As he pointed out, the utopian rhetoric, or 'technoromanticism' (Coyne 1999) that characterised the contemporaneous period, was rooted in an ideology of a benevolent and error-free technology. Such an ideology shadowed what was extolled at the time as a universally accessible information superhighway[125] - the Internet - a newly developed technology which would empower the politically and socially weak and foster community.[126] An emphasis on the positive social, cultural and political implications of digital technology - which was typical of public discourse at the time - and therefore, on a

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[125] In the 1990s the term 'information superhighway' was used to refer to digital communication systems and the Internet telecommunications network.
[126] Critical responses to the social, political, cultural and psychological implications of the advent and subsequent development of digital technologies, such as those proposed by Rifkin, Turkle and Slouka, for example, are an area that is fruitful for critical exploration. As such a study would necessitate a full-scale project of research and thesis of its own, an in-depth discussion of technophobia in response to the digital technological revolution is beyond the scope of this thesis. Interested future researchers should, perhaps, attempt a critical historiography of such responses that would enlighten the wealth of research that already exists into the historiography of digital technological development.

constantly reliable and optimally functioning underlying technology, was fundamental to any such ideas of social, cultural and political emancipation that was anticipated as a result of the technological revolution. With this dominant ideological narrative of digital culture, which has largely persisted - according to various perspectives - into the present time, as a conceptual backdrop against which to critically analyse the narrative of *Glitch*, we can appreciate the discursiveness of the video's functional and structural glitches.

Turkle's research into the psychological implications of our changing relationship with technologies also informs the current analysis of glitch narrative. In *Life on the Screen: Identity in the Age of the Internet* (1995) she critically engages the changes to human identity that have been wrought by what she identified as an increasingly diminishing conceptual - and therefore, psychological - distinction between humans and computers in 1990s digital culture. Because of this, she identifies how the natives of that culture began to develop an inability to distinguish humans and the places of the lived world, from machines and computing technologies. Due to the development of digital technologies, according to which more and more human processes were being subsumed by the digital machine, she questions how successfully contemporaneous society differentiated between the lived and virtual worlds. Videos like *Glitch* formally integrate aspects of the lived and virtual worlds in order to draw attention to the cultural specificities of a period in which the integration of those worlds is even more profound than it was in the period that was of concern to Turkle.

By interrelating functional and structural glitches with images and sounds that model the objects, beings, places and systems of urban spaces, *Glitch*'s narrative transposes notions of error, the transgression of optimal technological operation, and

the articulation of the technological mediation itself from an exclusively technological point of view, so that these notions can be conceptually linked to the particularities of urban spaces. In so doing, the video's narrative is discursive of the impact of these technological issues in relation, specifically, to the urban experience. Founded on essentially fallible technologies, the systems and networks that underpin the urban experience facilitate the operation of society that is concentrated in the city. Implicated in this condition of contemporary culture is the threat of extensive fallout that would result from the error or malfunction of those technologies. Because how we live in urban spaces depends on the optimal functioning of its underlying technologies, their malfunction would have wide-ranging ramifications for the operation of culture and society. *Glitch* employs glitch in order to bring these issues to the video's narrative and by extension, to the public consciousness.

Rather than formally interrelating glitch with other on-screen objects as in *floW* and *Glitch*, *HARDCORE_GLITCH* models human beings through glitch, fusing them with pixels that model the imprecision of digital data as it endeavours to reproduce the human form. These visual glitches are echoed in the soundtrack whose sonic counterparts similarly express the inaccuracy of digital data as it attempts to reproduce the soundtrack's constituent sounds. The video's abundance of glitches exaggerates, and therefore emphasises, the inaccuracies inherent in the process of encoding and reproducing naturally occurring phenomena, like light and sound (or indeed, analogue representations of these), through digital data.

The human beings and sounds that LePôLe models through glitch formalise the intermediary virtual space that exists (if the virtual can be said to exist) between the human being and digital technologies in processes of interactivity. In their research into datamosh, Brown and Kutty describe the human-background

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relationship in datamoshing as ecological: 'in the sense that we are seeing humans interact with/assemble with, or from, pixels; that is, within the frame of the datamosh, the human and monstrous figures have an ecological relationship/form an ecology/form a network with computers' (2012: 171). As with datamosh – albeit a more extreme mode of glitch where it entirely supplants the original image – the human beings rendered through glitch in *HARDCORE_GLITCH* visibly meld with the digital technologies that mediate them.

Melding human and technology in this way, *HARDCORE_GLITCH*'s narrative relates the necessarily digitised human being that is at the centre of our engagement in digital culture. The narrative articulates how these beings are mediated through technologies that necessarily comprise a risk of malfunction or imprecision of reproduction. It expresses the conditions of contemporary digital culture in which our actions, and indeed our selves, are increasingly mediated through fallible digital technologies in order to engage with digital networks and each other, through those networks. Through glitch, the narrative conveys the loss of nuance that occurs in the conversion of the human being into digital data and so, emphasises the distinction between the human being in the lived world, and the digitised version of the human being that is at the centre of digitally mediated social and cultural engagement.

Vernacular, and indeed scholarly, evaluations of social media that uncritically substitute the digital self for the self substantiate the existing dominant ideology of digital technologies as a benign and seamless cultural mediator. Hainge notes how this ideology is based on a misconception: 'the digital technology that is supposedly superclean and noise free is, in fact, merely better at disguising its noise and errors that [...] always and necessarily form a part of its message' (2007: 34). He adds:

'through the failure that it foregrounds, glitch in fact shows us the extent to which digital technology always relies on a successful integration of failure into its systems' (Hainge 2007: 35). The narrative of *HARDCORE_GLITCH* emphasises the noise that is intrinsic to mediation by modelling its content exclusively through glitch. It thus articulates the fallibility of the digital technology through which we increasingly communicate, socialise and engage our shared cultural heritage and contemporary culture.

Conclusion

Musicologist Kim Cascone has argued that the 'post-digital aesthetic' of glitch music emerged 'as a result of the immersive experience of working in environments suffused with digital technology' (2000: 12). Considered from the perspective of contemporary digital culture, and in light of the videos analysed above, we can appreciate how glitch audiovisuality has emerged as result of working and living in and through digital technologies. Those videos formally, conceptually and narratively articulate aspects of the experiences of a culture that is increasingly mediated by digital technology.

floVV, *Glitch* and *HARDCORE_GLITCH* exploit the glitch's formalisation of the data processes of digital technology in order to produce audiovisual narratives that are discursive of the increasingly central role of technology in contemporary culture. By formally interrelating glitch with images of our shared cultural heritage, our urban systems, and our selves, respectively, these videos emphasise the often-elided digital technologies that mediate our cultural heritage and contemporary cultural practice, our experiences of, and within, the urban spaces in which the majority of us live, and our interpersonal exchanges. In addition, they emphasise the potential for error that is inherent in such technologies.

The capacity that digital technology has shown to simplify, automate and replicate so many different kinds of media technologies, has engendered contemporary – so-called – digital culture. Emerging from that culture is the digital mediation of so many of our hitherto 'sensitive' socio-cultural exchanges. The increasingly accepted involvement of digital technology in our personal archive of

memories (*Tumblr/Instagram,* [127] for example); our personal lives and opinions (*Facebook/Twitter,* [128] for example); and our personal preferences and taste (*iTunes/Pinterest,* [129] for example), exemplifies our trust in, and reliance on, that technology.

Indeed, the ideology of digital technologies encourages us to focus on the precision and efficiency of digital technologies, rather than on the degree of error or imprecision that is inherent in them. Menkman has pointed out how glitch aesthetics 'critique the medium itself, as a genre, interface and expectation. They radically challenge the technological, social or ideological constructedness of all media cultural formations' (2011: 44). The glitch narratives of *floVV*, *Glitch* and *HARDCORE_GLITCH* encourage us to critically reflect upon the ideology of error-free digital technology that pervades and underpins contemporary digital culture.

As a development of noise practices that featured throughout the analogue media arts into the current period, the conceptual issues that the formalisation of glitches in the videos draws into those videos are specific to the technocultural context from which they have emerged. The glitches that feature in *floVV*, *Glitch* and *HARDCORE_GLITCH* draw attention to the digital technologies that underpin them. By formally incorporating the conceptual implications of the glitch - issues of mediation, technological malfunction, the subversion of practical and operational convention in technology, and so on - in the videos' audiovisual narratives, these

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[127] *Tumblr* is a microblogging platform and social networking website that allows users to post multimedia and other content to a short-form blog. *Instagram* is an online photo- and video-sharing service that enables its users to apply digital filters to their photographs and videos and share them through social networking services.

[128] *Facebook* is an online social networking service. *Twitter* is an online social networking and microblogging service where users can send and read text-based messages limited to 140 characters.

[129] *iTunes* is a media player library application developed by Apple. *Pinterest* is a pin board-style photo-sharing website that allows users to create and manage theme-based image collections.

issues are brought to light in relation to the other on-screen subjects recording in the lived world.

As a result, the videos are discursive of the specificities of digital technology as they relate to the contemporary experience. *floVV*'s narrative, in which the glitch subverts the presentation of images that describe the history of Western visual culture, explores the fact that so much of our cultural practice - in terms ranging from the making of art to the socio-political exercise of culture through our engagement with each other through the network - now depends on digital technologies and cultural engagement. *Glitch*'s narrative, in which the glitch subverts the presentation of images that describe the technological systems and structures that underpin the operation of urban spaces, explores how the operation of public life is increasingly mediated by digital technologies. *HARDCORE_GLITCH*'s narrative, in which the glitch entirely subverts the presentation of images of human beings in domestic and social situations, explores how the engagement of the human being with others through the digital network necessarily involves a digital reproduction of the self. Common among all of these videos is the discursiveness of the glitch as the articulation of failure in the digital technologies that facilitate the operation of cultural, social and political life, which is specific to our experiences as natives of digital culture.

In the epigraph to this chapter, Menkman advises that any critical engagement with the glitch in the digital arts should focus on its non-physical, interpretative or conceptual characteristics, as much as it does on its technological characteristics. My critical analysis of the videos in this chapter has engaged the audiovisual glitch in those terms. It has identified how the glitch formally articulates the inherent and technological specificities of digital mediation; how it introduces a range of

technologically centred conceptual implications to the audiovisual narrative; and the narratives that its formal interrelation with the other content of the videos produces. Thus, through their innovative application of the glitch to audiovisuality the videos enable us to perceive and consequently, to consider, the virtual, typically hidden, technologies that are central to contemporary digital culture.

As a result of the analysis of the videos, it is clear that the technological, formal, conceptual and narrative specificities of the glitch cannot be approached or understood as isolated elements of the video text. Rather, their various significances have been revealed as being contingent on one another. For example, our encounter with the inherent and technological specificities of the glitch reveals those specificities to us, which are simultaneously formally articulated. Given the digital cultural context of our encounter with these inherent, technological and formal specificities, this encounter produces a number of conceptual implications that derive from our lived experiences of engagement with, and through, digital data.

While the inherent, technological, formal, conceptual and narrative implications of the glitch are interdependent and defined in relation to one another, I have attempted in this chapter to trace a logical path through their definition and analysis through the videos studied. The necessary and inextricable interrelation of those implications of the glitch in the videos reveals one aspect of the digital audiovisual medium which itself is articulated in the interrelation of the inherent, technological, formal, conceptual and narrative implications of the glitch, the loop, the interface and the database in contemporary online video.

Chapter 4:   Loop

Nonlinearity is a fundamental property of digital worlds. And it's only as the foundation of
logic shifts from the linear to nonlinear that we will completely discover the *new* in the digital.
[...] the nonlinear nature of digital worlds is part of digital expression.

Steven Holtzman
Digital Mosaics: The Aesthetics of Cyberspace (1998)

The loop describes the process within all digital communications systems whereby the

list of commands controlling the system's operation – the programme – is iterated in

sequence. This fundamental aspect of digital communications follows a loop pattern,

where a particular programme task is repeated until a related function is satisfied, and

is then followed by another, and so on. As with the glitch, which formalises the

typically elided digital data that underpins digital technological processes, so the loop

formalises the protocols according to which this data is configured in digital

technological processes.

Tracing a theoretical link between the language of early film and that of new

media at the turn of this century, Manovich identified the loop as a key lexical

element of the language of new media (2001: 314-322). He argued that:

> It is relevant to recall that the loop gave birth not only to cinema but also to
> computer programming. Programming involves the altering of the linear flow
> of data through control structures, such as if/then and repeat/while; the loop is
> the most elementary of these control structures. Most computer programs are
> based on repetitions of a set number of steps; this repetition is controlled by
> the program's main loop. [...] As the practice of computer programming
> illustrates, the loop and the sequential progression do not have to be
> considered mutually exclusive. A computer program progresses from start to
> finish by executing a series of loops. (Manovich 2001a: 317)

Manovich's millennial research exploited theoretical concepts from the disciplines of

analogue audiovisuality and information technology. In both of those spheres, loops

typically enact the sequential progression of repeated visual phenomena or, of the

individual commands of computer programmes, respectively, and so he naturally

theorised the loop in terms of temporal progression. However, if we consider the impact of the specificities of digital technologies in the forms and experiences of contemporary digital culture, we can identify the temporal *and* the spatial significance of the loop.

Chapter 2 of this thesis identified the diverse spatio-temporalities that occupy the multiple tabs of an Internet browser as an everyday example of the digital spatio-temporal loop. The individual spatio-temporalities within each tab coexist with those of the other tabs that occupy the space of the desktop,[130] but operate individually, according to their individual programmes. On a larger scale, we can appreciate how the Internet functions in a similar manner, in which innumerable spatio-temporalities coexist, but maintain their spatio-temporal individuality. This is evident in our interaction with the Internet, which is characterised by spatio-temporal multiplicity, variability and simultaneity. Manovich proposed the loop as a 'new temporal aesthetics for computer-based cinema' (2001: 320). As the analysis of online videos in this chapter shows, the loop is both temporally *and* spatially significant in the integrated formal, conceptual and narrative aspects of digital audiovisuality.

The recent online videos *Kaizer* (2006) by Kotaro Tanaka, *LoopLoop* (2008) by Patrick Bergeron and *Metro: Paris - Hong Kong underground* (2009) by Gilles Delalex, Yves Moreau and Thomas Wessel-Cessieux demonstrate various nuances of spatio-temporal multiplicity, variability and simultaneity that the digital loop introduces to audiovisuality. These videos were selected for analysis because they each comprise distinct formal strategies according to which the spatio-temporal specificities of digital technology are audiovisually realised through loop. However,

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[130] The working area of a computer screen widely regarded as a representation of a notional desktop.

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they cohere in terms of their narrative articulation of the conceptual implications of these specificities of digital technology in contemporary culture.

In this chapter I critically analyse the formal, conceptual and narrative implications of the loop in these online videos in order to establish the technocultural significances of the loop that they audiovisually articulate. Following a methodology of close textual analysis, I examine how the videos formally assert the inherent and technological specificities of the loop, thereby interrelating its conceptual implications and the other content of the videos to produce narratives that relate various aspects of contemporary digital culture. This analysis employs a theoretical model that combines conceptual elements derived from established digital arts scholarship that illuminate the inherent, technological, conceptual and cultural specificities of the digital loop, the conventions of media communications, and the technological mediation of sound and urban spaces.

Section 4.1, 'Creative context of the videos selected for analysis', establishes the context of the videos analysed, in terms of trends within the bodies of work of the artists responsible.

Section 4.2, 'The audiovisual formalisation of the loop', addresses the formal construction of each of the videos from the perspective of the inherent specificity of the loop as evinced in the spatio-temporal multiplicity, simultaneity and variability that it has introduced to our cultural experiences of digital space, such as that of the Internet.

Section 4.3, 'Formal loop and technology', analyses the technological significance of the formal composition of loops in the videos. The analysis employs a theoretical model that exploits existing scholarship on the digital specificity of screen composition, interactivity and mediated perception, and the role of sound in

audiovisuality. Manovich's theory of spatial montage (2001a), Murray's analysis of the spatio-temporal diversity of interactive processes (2000) and Virilio's concept of the digital 'splitting of viewpoint' (2001), combine to elucidate the technological specificity of the videos' composition of loops. Michel Chion's research into film sound (2009) informs my analysis of the innovative use of sound in *Kaizer*.

In section 4.4, 'Conceptual implications of the formal loop' - the analysis of the conceptual implications that the loop introduces to the videos - employs a theoretical model that draws on scholarship concerning the experiential impact of digital technologies. It exploits Holtzman's analysis of the conceptual significance of digital non-linearity (1998), Virilio's theory of the integrated extensive and intensive temporalities of digital culture (2001), Munster's theoretical coextension of the sense experience and cognition in interactivity (2001) and Vito Campanelli's theories of the digital 'aesthetics of continuity' and 'aesthetics of repetition' (2010). In addition, I establish the communicative potential of the loop's subversion of convention via Fiske's theory of media convention (1982).

In section 4.5, 'Loop narrative', I analyse the narrative operation of the loop as it formally integrates with the other content of the videos, a scene from an urban park, a number of scenes from an underground rail system, and an abundance of urban scenes observed from the window of a moving train. Holtzman's theory of the impact of digitally mediated experiences on future media narratives (1998) and Tim Barker's analysis of the multi-temporal configurations of those experiences (2012), informed by Munster (2001) and Murray's research into the temporal *and* spatial specificities of interactivity (2000), inform my analysis. It is also elucidated by William J. Mitchell's research into the cultural impact of the technological systems that underpin urban spaces (2005).

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Rather than being selected for discussion simply because they include formalisations of the loop, *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* are key to the current discussion because they demonstrate the conceptual complexity that the loop introduces to online video, and whose organisation of the content of these videos produces innovative audiovisual narratives that articulate the spatio-temporal multiplicity, simultaneity and variability that is specific to digital mediated experiences. These implications of the loop derive from our experiences of engagement with and through digital technology throughout contemporary culture, which likewise informs the narrative significance of the loop in those videos. Despite their differing formal approaches to loop composition, the videos are nonetheless related through their formal articulation of its inherent, technological and conceptual specificities and their narrative articulation of its significance in contemporary digital culture.

Kaizer comprises a dynamic collage of a number of spatio-temporally diverse loops that operate independently of each other, but nonetheless cohere within the space of the video. Tanaka's innovative compositional strategy emphasises the temporal aspect of each of the video's constituent loops, while their spatial dimensions merge into the consistent space of its over-arching principle panning shot. This produces a strikingly unconventional construction of space and time within the video's narrative whereby spatio-temporal cohesion is eschewed in favour of a formal assertion of space and time as multiple, synchronous, various, and so on. In addition, Tanaka desynchronised the original footage, to produce discrete sonic and visual loops that he nonetheless treats in a similar manner. The composition of loops in this video, in which space and time and sound and vision are multiplied and behave

asynchronously, subverts the established conventions of audiovisuality that preserve narrative linearity and temporal and audiovisual cohesion.

Conventional audiovisuality attempted to model consistent space and time through techniques such as continuity editing, and so on. The central aim of this was to attempt to produce realistic audiovisual narrative, or that which could attempt to replicate the lived world for the audience, so that the willing suspension of disbelief could be encouraged and audience immersion in the story could take place. Indeed, the foundation of many aspects of film studies is the far-reaching and multifarious concept of identification with the film, from the point of view of character, diegesis, genre, and so on, which rests on our immersion in the film narrative. Implicit in these related foci of film studies is the idea that the film text can, and perhaps does, in some way replicate our experience of the lived world.

The videos under discussion in this chapter subvert the conventional construction of space and time within the video frame. I would argue that, as a conceptual extension of the underlying theory of much of traditional film studies, the spatio-temporality of these online videos is constructed in such strikingly unconventional ways as an attempt to articulate the new experiences of space and time that digital technologies have introduced to contemporary culture.

Because of its unconventional spatio-temporal construction that is based in the on-screen composition of variable and multiple loops of audio and visual material, *Kaizer*'s narrative enables us to perceive the impact of digital technologies on our experience of the lived world. One of the fundamental specificities of the contemporary cultural experience of digital technology is the condition whereby time and space have become multiple, variable and diverse experiential categories within the consistent space and time of the lived world within which they operate. The

multiplication of space and time within the frame of *Kaizer* formally articulates our experience of digital culture wherein our experiences of space and time are also multiple and various. This technocultural specificity of its construction of time and space is compounded by Tanaka's creation of loops exclusively featuring human beings. The erratic and unconventional movement of the human beings in the video emphasises the multiplicity, variability and simultaneity of diverse temporalities that are contained within its frame. The coexistence of multiple temporalities within the space of the video produces *Kaizer*'s audiovisual narrative, articulating the temporal multiplicity that is specific to the digital cultural experience, where the consistent time of the lived world is invaded by the multiple temporalities of digital technology.

LoopLoop comprises a varying number of stratified loops. The spatio-temporality of each of the loops coexists with that of the others in the video and each operates individually, according to its own parameters. Bergeron's loops depict the view from the window of a moving train. He loops the sound of the train to accompany the visual movement of the loops, in which they proliferate and decrease on screen, progress and regress, and vary in speed. Bergeron's innovative composition of loops emphasises their differential and relative spatio-temporalities by stratifying them on screen, so that their relative difference is accentuated by their on-screen proximity. As a result, these loops draw the conceptual implications of spatio-temporal multiplicity, variability and simultaneity of digital technologies into the video's narrative. Its formal integration of these specificities of the technologies underpinning the video and its scenes of urban life draw our attention to the technological systems that similarly underpin the urban environment. As a result, *LoopLoop*'s narrative relates the impact of digital technologies in urban environments and consequently, on our experiences of and within those environments.

The composition of *Metro: Paris - Hong Kong underground* involves the imbrication of a sequence of spatio-temporal loops. The loops are of a very short duration and are regularly repeated within the sequence. This compositional style, coupled with over-exposure techniques and intermittent flashes of white light, produces a stroboscopic visual effect. This is echoed by Delalex, Moreau and Wessel-Cessieux's similar treatment of loops of sound, which produces a staccato effect. Their imbrication of loops distributes diverse spatio-temporalities through the depth of the screen, thereby layering and repeating the actions of the commuters using the rail system. The video includes a short piano interlude that is accompanied by a number of still images of the commuters inside train carriages. The explicit contrast between the significantly limited spatio-temporality of the video's still images and the comparatively extensive spatio-temporality of its loops, accentuates the multiplicity and variability of spatio-temporalities that the video comprises. Its interrelation of diverse scales of time and space with scenes of urban life produces a narrative that articulates the digital mediation of the contemporary cultural experience.

4.1   Creative context of the videos selected for analysis

Kotaro Tanaka is a prolific independent digital artist whose practice spans music video, video remix, documentary, video art, VJing [131] and producing concert visuals. [132] In his interdisciplinary digital audiovisual practice he explores various themes including, memory – *Nancy & Henry* (2013), process – *Fun On The Sumida River* (2009), absence – *invain* (2011) and *Bye Bye Alfred* (2012), and the gaze – *Kaizer* (2006) and *Holidaze* (2012). Despite the considerable scope of his work, not only in terms of thematics, but also in terms of subject matter, formal construction and genre, each of his videos and indeed, his extended practice, is marked by distinctly digital aesthetics. *Kaizer* is exemplary of his digital style of audiovisuality, in which his innovative construction of image and sound through the loop models a digitally mediated perception of the lived world.

Canadian visual effects and video artist and researcher, Patrick Bergeron's digital audiovisual work spans both commercial [133] and independent practice. [134] His interdisciplinary independent digital audiovisual practice combines unconventional image and sound construction with documentary elements in order to explore themes of space, place, time, speed and memory. *LoopLoop* (2008) belongs to a period of his work – including *Cars ...* (2008) and *Travelling with Business Cards* (2008) – in which he explored the spaces, places, customs and culture of Southeast Asia. Using innovative editing techniques to fragment, repeat and layer both sound and image elements, in these videos he articulates the intense repetition of that underpins both the experiences of urban culture and the establishment of cultural custom.

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[131] VJing is the live production of visuals, typically to accompany electronic music performance (DJing).
[132] Tanaka's work is available to view at: http://vimeo.com/kotarotanaka.
[133] Bergeron has produced visual effects (VFX) for *Lord of the Rings: Fellowship of the Ring* (2001), *Lord of the Rings: Two Towers* (2002), *Matrix Revolutions* (2003) and *Asterix et Obelix* (2012), amongst many other films.
[134] Bergeron's work is available to view at: http://vimeo.com/patbergeron.

Muoto is an architectural firm set up in Paris, in 2003, by three European partners: Gilles Delalex (France), Yves Moreau (Belgium/France) and Thomas Wessel-Cessieux (UK/France). In addition to their architectural design work, they are also involved in art installation and academic research. Their digital audiovisual practice is rooted in photography and centres on the visual study of architectural form and purpose in videos such as *Concerto for Infrastructures* (2008) and *statiorama* (2013). [135] *Metro: Paris - Hong Kong underground* (2009), a study of the underground rail systems of the titular cities and of their use, is typical of their audiovisual style through which they convey both the architectural spaces and the experiences of using those spaces. They do so using innovative editing techniques in the construction of imagery and in the remix of ambient sound and music.

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[135] Muoto's work is available to view at: http://vimeo.com/muoto.

4.2   Audiovisual formalisations of the loop

Manovich argued that the digital loop engendered a new cinematic montage form 'in which the diacronic [*sic*] dimension is no longer privileged over the syncronic [*sic*] dimension, time is no longer privileged over space, sequence is no longer privileged over simultaneity, montage in time is no longer privileged over montage within a shot' (2001: 326). The formalisations of the loop in *Kaizer, LoopLoop* and *Metro: Paris - Hong Kong underground* demonstrate nuanced associations of the diachronic and synchronic organisation of space and time.

Fig. 4.1 *Kaizer* (2006) by Kotaro Tanaka

Tanaka's dynamic collage-style approach to the on-screen composition of loops produces *Kaizer*'s spatio-temporal multiplicity, variability and simultaneity. The video begins by presenting an unremarkable everyday scene into which he introduces an increasing number of diverse and independently operating spatio-temporal loops. Tanaka's juxtaposition of loops allows multiple temporalities to coexist within the principal panning shot that the camera executes, which emphasises the multiplicity of temporalities that operate independently within its coherent space.

Fig. 4.2 *LoopLoop* (2008) by Patrick Bergeron

By contrast, the space of the screen in *LoopLoop* is immediately fractured by its stratification of individual spatio-temporal loops. The spatio-temporal variability of the video soon becomes evident as its numerous loops begin to move in different directions, and at different speeds, to each other. Their on-screen horizontal correlation emphasises the diversity of the spatial and temporal construction of each of the loops and the simultaneity of their variable movement. In addition, the changing 'focal length' of our view of the loops, oscillating between wide-shot and close-up, and the incorporation of still imagery, further compounds the video's spatio-temporal variability.

Fig. 4.3 *Metro: Paris - Hong Kong underground* (2009) by Gilles Delalex, Yves Moreau and Thomas Wessel-Cessieux

The looping of very short sequences of images in *Metro: Paris - Hong Kong underground*, coupled with over-exposure techniques produces its bewildering visual style. Its corresponding looping of sounds produces the driving, mechanical, rhythm

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according to which the image loops are edited together. A counterpart to Tanaka's juxtaposition and Bergeron's stratification of loops, the compositional strategy that Delalex, Moreau and Wessel-Cessieux employ imbricates the video's spatio-temporal loops. This affects screen space in terms of its depth, whereby the temporality of duplicate footage is repeated through layered loops.

Kaizer is set in a public park that the camera explores through a 360° panning shot[136] taken from a fixed, central position that compares visually to a point-of-view shot[137] – albeit without its conventional counterpart – the reverse shot.[138] As the camera rotates on a central axis, the video allows the audio-viewer to survey the park and the people in it and to hear the diegetic location sounds[139] of the environment and the voices of the people occupying the space.

Initially the video offers an unremarkable everyday scene, but as it plays, the audio-viewer is soon made aware that the movement of the people on-screen is caught in a kind of freeze-frame, while the camera continues to rotate. Before long the people start to move again, but this time they move asynchronously to each other, at a range of different speeds and in different directions. For example, one man walks backwards while others move forward at a normal pace, while others are caught again in a freeze-frame. Visually, individuals and groups of people are caught within individual motion loops whose temporality is distinct from that of the other motion loops that also occupy the video. These diverse loops are composited within the

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[136] Panning is a camera movement whereby the camera rotates, following a horizontal trajectory, on the central axis of a tripod or pedestal.

[137] A point of view shot (also termed subjective camera) is a type of camera shot typical in audiovisuality whereby the camera allows the viewer to see from the point of view of an on-screen character.

[138] Shot reverse shot is a convention of audiovisuality whereby two shots are edited together in order to allow the viewer to see a character and to see what that character is looking at.

[139] Diegetic sound is any sound presented in an audiovisual text, such as a film or a video, as though it originated within the film or video's world.

principal panning shot that (almost) continually pans left, modelling a coherent space within which they operate.

The sonic element of *Kaizer* consists entirely of ambient sound – the 'sound that envelops a scene, inhabits the space without raising the question of the location of its specific source(s) in the image' (Chion 2009: 467). Dialogue can be heard on the audio track, but as the voices are not explicitly attributable to any on-screen characters it functions as ambient sound. As with the image, these sounds are also looped and play forwards and backwards at different speeds.

Kaizer formally emphasises the temporal aspect of its loops, which are seamlessly composited into the consistent space of the overarching principal panning shot. As a result, the individual temporalities according to which the people move within each loop are foregrounded in the video, while the individual spatiality of each loop is absorbed into the principal panning shot. This formally emphasises the multiplicity, simultaneity and diversity of the temporalities in this video, which contrasts with the initial spatio-temporal cohesion of its establishing shot.[140] This initial spatio-temporal cohesion is aurally replicated by Tanaka's use of ambient sound, which sonically models the space of the park.

As Tanaka introduces an increasing number of spatio-temporal loops, the temporal inconsistencies within the scene of the park become increasingly complex. The increasingly complex looping of the ambient sounds of the park echoes this. Through Tanaka's innovative and complex looping of visual and sonic elements, the video's initially innocuous presentation of everyday life rapidly morphs into something quite unreal.

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[140] An establishing shot in audiovisuality is usually a wide or long shot that sets up, or establishes the scene. It is usually positioned at the beginning of a scene.

LoopLoop is set in an urban rail system and is structured entirely from multiple loops of audiovisual footage[141] that present the view from the window of a moving train. Throughout the video Bergeron composites a varying number of spatio-temporally diverse loops within its frame.

LoopLoop begins with a number of – initially static – horizontally layered loops that coexist within the video's frame, immediately fracturing the space of the screen. As the video plays, the spatio-temporal dissonance of its constituent loops becomes increasingly evident. The top loops move forwards, while the bottom loops move backwards, and the upper- and bottom-most loops move faster than those positioned towards the centre of the screen. The sound of a train speeding up, slowing down, or being played in reverse, accompanies the visual movement of the loops.

The variability of the movement of visual and sonic loops is further emphasised by the changing 'focal length'[142] of our view of the loops. Initially, the loops get increasingly larger on screen, giving the impression that the 'camera' is zooming in, until only five stratified loops remain visible. Then suddenly, to the sound of the train played in reverse, the 'camera' rapidly zooms out, revealing a proliferation of loops. Soon, the 'camera' zooms in again until only one loop is visible on screen. This loop progresses in a forward motion until, to the sound of the train playing rapidly in reverse, it regresses at a high speed. This constant oscillation of the 'camera' from wide shot to close-up, and back again, compounds the spatio-temporal variability of the video.

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[141] Footage is a term that emerged in audiovisual practice to refer to a length of film (originally measured in feet) used to shoot a scene. It endures in contemporary audiovisual practice in extended usage, where it refers to the audiovisual material that has been recorded through a camera, whether digital or analogue.

[142] Focal length in lens-based media is the distance between the centre of the lens and its focus – I use the term in this section to describe the visual effect in *LoopLoop* that mimics the view through an oscillating zoom lens on a camera.

This spatio-temporal variability is further emphasised by the visual analogy, according to which the loops present the view from the window of a moving train. The alternating regressive and progressive movement of the loops subverts the train's normative progression and thus, stresses the spatio-temporal variability of this journey through urban space. In addition, in the middle of the video, the loops break away from each other and then internally break down into frames, further asserting the video's variable spatio-temporality.

Metro: Paris - Hong Kong underground is set in an underground rail system that connects the urban centres of Paris and Hong Kong.

The video is structured using visual loops of predominantly one-second duration, which rapidly move back and forth, creating a stroboscopic visual effect. The video's almost exclusive use of black and white, combined with overexposure[143] techniques and the punctuation of the sequence of loops with flashes of white light, further compounds this visual effect. Some of the video's images were shot using a slow shutter speed,[144] creating blurred imagery that adds to its bewildering visual style.

This visual style is underscored by the video's soundtrack, which incorporates a variety of short loops of mechanical and electronic sounds that similarly progress and regress. They are arranged in a driving rhythm, which echoes the visual rhythm of the video.

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[143] Overexposure is a term applied to lens based practices to describe an image that has a loss of highlight detail, when the bright parts of an image are exaggerated so that they become completely white, or overexposed.
[144] Shutter speed is a photography term that refers to the length of time that a camera's shutter is open when taking a photograph.

The video comprises loops that present the movement of commuters in a train station. They are edited together using a cross-dissolve[145] technique, in which the start of the incoming loop is superimposed over the end of the outgoing loop. Because of this editing technique, the loops show sets of commuters repeatedly covering a limited area of ground in the train station. The imbrication of loops extends the visual space of the audiovisual narrative through the depth of the screen. However, the imbricated repetition of loops is both spatially and temporally significant. As cross-dissolve editing extends visual space, so the repetition of loops multiplies temporality within that space.

An interlude of melodic piano music interrupts the narrative and is accompanied by very short visual cycles of commuters inside train carriages. This section of the video includes its only coloured sequences. After this interlude, the repetitive, driving electronic and mechanical noises return, as does the black and white looped imagery.

The journey begins in a train station in Paris and ends in Hong Kong, where commuters repeat the same short excerpts of their journey that loop backwards and forwards until they eventually (and repeatedly) approach the train station exit.

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[145] Cross-dissolve editing is a method of editing in audiovisuality that creates a transition between two images, whereby the second image is gradually superimposed over the first image until it eventually supplants it. Cross-dissolve editing offers a more graduated transition between images than the conventional cut.

4.3   Formal loop and technology

Analogue audiovisual technologies 'were designed to completely fill a screen with a single image' (Manovich 2001a: 324) and so, the space of the loop correlated to the extent of the space depicted on screen. This exclusively temporal significance of the loop extended into early Web video technologies, such as *QuickTime*,[146] where "movies" played on the *QuickTime* player would loop, by default, until the user intervened. *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* exploit the advanced capabilities of contemporary digital technology to produce spatio-temporally complex formalisations of the loop. The following technologically informed analysis of the formal construction of the loop in these videos elucidates their relationship to the technologies that underpin the digital arts and online space.

The analysis employs a theoretical model that exploits existing scholarship that has engaged the specificities of digital technology in screen composition, interactivity and mediated perception, and the role of sound in audiovisuality. Michel Chion's theory of ambient sound in *Film, a Sound Art* (2009) informs *Kaizer*'s innovative foregrounding of this typically background sound. Manovich's theory of spatial montage in *The Language of New Media* (2001a), Murray's analysis of the spatio-temporal diversity of interactive processes in 'Digital Incompossibility: Cruising The Aesthetic Haze Of The New Media' (2000), and Virilio's concept of the digital 'splitting of viewpoint' in 'From Modernism to Hypermodernism and Beyond' (2001) combine to elucidate the technological significance of the formal composition of loops in the videos.

Kaizer's dynamic collage of independently operating temporal loops exploits the mutability of digital data to formally emphasise the video's underlying

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[146] *QuickTime* is an extensible multimedia framework, launched as a rudimentary digital video player in 1991, that is now capable of handling a wide range of audiovisual, sonic and visual digital formats and interactive processes.

technologies that are based in the looped programming of that data. *LoopLoop*'s stratification of independently behaving loops totally subverts the potential spatio-temporal cohesion within the frame of the video, by constantly varying the number of loops that coexist on-screen. The compositional strategy of *Metro: Paris - Hong Kong underground* imbricates a number of short duration loops so that both space and time are layered through the density of the screen. The various compositional strategies of the loop in these videos formally model the spatio-temporal multiplicity, variability and simultaneity that digital technology produces, both formally, in the digital arts and online space, and experientially, in our interaction with them.

In *Kaizer* Tanaka formally fragments screen time through composition techniques, according to which a number of independently operating temporal loops coexist on screen. In addition, he desynchronises sound and image to produce discrete sonic and visual loops that he asynchronously employs throughout the video. As a result of its multiplication of screen temporalities and of its disconnection of the sonic from the visual, *Kaizer*'s initially innocuous, everyday scene of public life is subverted by the strange mechanical and repeated movements of the park users and the similarly mechanical and repeated ambient sounds of the space of the park.

The strange behaviour of the on-screen characters is reinforced by Tanaka's manipulation of sound in which he takes small audio samples of location sound, makes temporally regressive and progressive loops out of them, and layers them to create a densely textured soundtrack. The location sound from which Tanaka makes loops would be more correctly termed 'ambient' (Chion 2009: 467). As with his treatment of the visual elements of this video, his manipulation of ambient sound turns innocuous, everyday sounds into strange, mechanical, cyclical noise. Ambient

sound is a common feature of audiovisuality, conventionally acting as background, atmospheric audio, over which primary audio – such as dialogue and sound effects – are typically layered. However, in *Kaizer* the function of this initially unremarkable background noise is transformed, through the loop, from its typical function as background audio, and is instead emphasised in the audiovisual narrative.

Both the imagery and sound of this video foreground the typically background systems that underpin the video. Visually, the fragmentation, repetition and multiplication of temporalities draw attention to the specificity of its facilitating digital technology, whereby these variable temporalities can coexist (Manovich 2001a: 326). This is augmented, through sonic analogy, by the video's foregrounding of conventionally background ambient sound, through its fragmentation, repetition and multiplication.

In response to 1990s visual culture, Virilio argued that synthetic perception should be considered 'in relation to the philosophical question of the *splitting of viewpoint*, the shared perception of the environment between the animate (the living subject) and the inanimate (the object, the seeing machine)' (1994: 60). In light of the subsequent growth of digital audiovisual culture, I would augment Virilio's theory with its essential sonic counterpart, whereby synthetic perception involves the living object and the seeing *and* hearing machine. My expansion of his theory illuminates *Kaizer*'s audiovisual narrative, whose visual and sonic loops model this essential condition of synthetic perception by formally emphasising that we perceive the park through digital technology.

Kaizer is characterised by its non-linearity, temporal variability and audiovisual desynchronisation. Manovich identified how the digital loop alters the linear flow of control commands in programmed digital systems. By extension, we

can appreciate how the digital loops in *Kaizer* subvert narrative linearity, and temporal and audiovisual cohesion, all of which are established conventions of audiovisuality.

The digital technology that underpins *LoopLoop* enables its individually articulated audiovisual loops, which continually vary in number, size, speed and direction, to nonetheless coexist on screen. The video's construction of variable, multiple and simultaneous spatio-temporalities asserts the capacity, specific to digital technology, for the formalisation of spatio-temporal diversity, and thus, the creation of experiences that are spatio-temporally diverse. This is evident in the example given at the beginning of this chapter, in which a number of individual tabs open in an Internet browser interface comprise variable and multiple spatio-temporalities, but nonetheless simultaneously coexist within the browser interface. As with the tabs of the Internet browser, the spatio-temporality of each of the loops in *LoopLoop* coexists with that of the others, each of which operates individually, according to its own parameters.

In spatial montage, Manovich said, 'nothing need be forgotten, nothing is erased. [...] In addition to montage dimensions already explored by cinema (differences in images' content, composition, and movement), we now have a new dimension – the position of images in space in relation to each other' (2001: 325). Manovich's theoretical model of spatial montage derives from the specific potential of its underlying technology. *Kaizer, LoopLoop* and, as I will show, *Metro: Paris - Hong Kong underground* exploit the advanced capabilities of digital technology – due to their development since the period in which Manovich conducted his research – where the spatial relationship of visual, sonic and audiovisual loops, rather than of exclusively image elements, introduces multiple temporalities to the space of the

screen. As a development of Manovich's concept of spatial montage, and in light of the sequential and linear associations of the audiovisual heritage of the term *montage*, it is appropriate to term the innovative formal construction of the videos currently under discussion as *spatio-temporal composition*.

Metro: Paris - Hong Kong underground demonstrates another nuance of spatio-temporal composition. Rather than juxtaposing disparate audiovisual loops within the space of the frame in a dynamic form of collage, as is the case in *Kaizer*, or horizontally layering them on screen, as is the case in *LoopLoop*, the cross-dissolve editing of loops in *Metro: Paris - Hong Kong underground* spatialises the image through the depth of the screen. Whereas the construction of loops in *Kaizer* and in *LoopLoop* affects screen spatiality understood in terms of a flat surface – as Manovich had theorised the screen, above – the construction of loops in *Metro: Paris - Hong Kong underground* also affects screen spatiality in terms of the density of the space of the screen.

Invoking Cartesian geometry we can elucidate Manovich's theorisation of the screen as comprising the x- (right-left) and y- (up-down) axes only. Applying this model to *Kaizer* and *LoopLoop*, we can appreciate how their strategies of spatio-temporal composition distribute diverse temporalities across the x- and y-axes of the screen. By contrast, the spatio-temporal composition of *Metro: Paris - Hong Kong underground* constructs loops in terms of the x-, y- *and* z- (forward-backward) axes of the screen. As a result, the imbrication of loops in this video distributes diverse temporalities through the depth of the screen.

Murray theorised the multiple, variable and simultaneous spatio-temporalities of digital technologies – which *Kaizer, LoopLoop* and *Metro: Paris - Hong Kong underground* model according to diverse formal strategies – as fundamental to

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digitally mediated experiences. He said: 'The technical ability to enfold the vicissitudes of space and time in the elliptical repetition of parallel structure might be the most novel feature of the horizon of the digital' (Murray 2000). As these videos show, the 'technical ability', or the technological specificities of the digital technologies involved, have enabled the videos' innovative formal constructions of space and time and inspired their formal construction in this way, in response to contemporary cultural experiences that are mediated by such technologies. He theorises interactivity as the 'elliptical repetition of parallel structure' between the human and the technology that facilitates their inter-communication. Such communicative processes comprise multiple, simultaneous and diverse spatio-temporalities, which range from layered and repeated, to discontinuous experiences of space and time.

4.4   Conceptual implications of the formal loop

Christine Ross noted how the loop is 'perceived by the viewer but produced by the computer,' where its phenomenology is 'solely on the side of the viewer who observes a scene through its digital repetition' (2006: 98). Given their formal emphases on the loop, *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* enable us to perceive the spatio-temporal specificities of digital technology, whose conceptual significance derives from its mediation of contemporary cultural experiences.

The following analysis of the conceptual implications of the loop in these videos employs a theoretical model that draws on scholarship concerning the experiential impact of the inherent qualities of digital technologies. It employs Holtzman's analysis of the conceptual significance of digital non-linearity in *Digital Mosaics: The Aesthetics of Cyberspace* (1998) and Virilio's theory of the integrated extensive and intensive temporalities of digital culture in 'From Modernism to Hypermodernism and Beyond' (2001). Munster's theoretical coextension of the sense experience and cognition in interactivity in 'Digitality: Approximate Aesthetics' (2001) and Vito Campanelli's theory of the digital 'aesthetics of continuity' and 'aesthetics of repetition' in *Web Aesthetics: How Digital Media Affect Culture and Society* (2010) further inform the analysis. Finally, Fiske's theory of the purpose of media convention in *Introduction to Communication Studies* (1982) enables me to establish the communicative potential of the loop's subversion of convention.

The diverse compositional strategies of the loop in *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* are related in terms of the scope of conceptual implications that they draw into the audiovisual narrative. Their juxtaposition, stratification and imbrication of loops, respectively, emphasise the

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multiplicity, simultaneity and diversity of space and time within the frame, drawing on our experiences of engaging the similarly multiple, simultaneous and diverse spatio-temporalities of digital technology and culture. *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* draw, through their formalisations of the loop, the conceptual implications of digital engagement into their audiovisual narratives. As with the link established in Chapter 3 between the authentic and contrived glitch, the authentic programming loops that underpin the spatio-temporal diversity that is specific to digital culture and online space, motivate the conceptual implications of the formal loop in these videos.

The loops in *Kaizer* fragment and multiply on-screen temporality, while the principal panning shot maintains the spatial cohesion of its narrative. Tanaka's video begins with the scene in the park presented as a spatio-temporally cohesive space. His successive introduction of loops within this space, fragments its temporal cohesion and multiplies its on-screen temporalities, so that the temporal multiplicity, simultaneity and diversity that the video presents nonetheless occur in a coherent space. By subverting the conventions of on-screen temporal cohesion in this way, Tanaka's composition of loops emphasises the variability of temporalities that coexist within the space of the video.

Considering the implications of digital technologies for our perception and experience of the world, Virilio noted how in the pre-digital period, 'the old image, the old reality, was a reality that can be presented as space-time reality. Man lived in a time system of his actual presence: when he wasn't there, he wasn't there' (Armitage 2001: 70). He proposed that digital technologies had introduced a new temporal condition to millennial culture, where 'man is present in this sort of time,

not via his physical presence, but via programming,' adding: 'We are living in both the extensive time of the cities [...] and the intensive time of the new technologies' (*Ibid.* 70; 71). The conceptual dialectic of extensive and intensive time that Virilio elaborates in his work on mediated visual cultures is illuminative of the spatio-temporal vagaries that define the contemporary digital cultural experience. While the extensive time of the lived world, or the consistent manifestation of time as has been historically experienced throughout the ages and as we continue to experience it in the world - 24 hours in a day, 365 days in a year, and so on - remains a constant in our lives, digital technologies insert their own various constructions of temporality within that consistent temporality. He categorises all of those other iterations of time that are produced in the digital domain as intensive time. This coexistence or cooperation of disparate temporalities that Virilio's theory describes encapsulates our altered relationship with and understanding of time because of the insinuation of digital technologies throughout our cultural-political experiences.

Kaizer's dynamic collage – perhaps paradoxically – coherently asserts the experiential and conceptual coexistence of multiple and variable temporalities that Virilio found specific to digitally mediated experiences of the world. In this way, the video's innovative formal construction of time conceptually refers to similar experiences of multiple and variable temporalities that we have when we engage with and in the digital network. The video's principle panning shot maintains an over-arching spatial coherence within which the multiple and variable spatio-temporal loops coexist. This shot's near constant panning to the left also maintains a visual semblance of an over-arching temporality that is, however, fractured by the introduction of successive loops. Using Virilio's terminology, we can recognise how the panning shot models the extensive time of the city (or in this case, the urban park)

and the temporal loops that emerge within that shot model the intensive time of the network (the multiple, variable and simultaneous temporalities that digital technologies have introduced to the contemporary cultural experience).

The video formally merges the extensive and intensive temporalities whose merging underpins the experience of digital culture. As a result, it asserts the reciprocal experiential and technological specificities of the digital means of cultural mediation. As Vito Campanelli states: 'The aesthetics of continuity perfectly corresponds to the liquid architecture of cyberspace. This architecture no longer allows the mere over-lapping of elements; the addition of a new element requires morphing, metamorphosis, and genetic mutation' (2010: 206). *Kaizer* formally articulates the complexity of Campanelli's digital aesthetics of continuity in its seamless blending of the spatial aspect of its individual spatio-temporal loops into the space of the principle panning shot. Simultaneously, the multiplicity and variability that the temporal aspect of those loops introduces to the consistent space of the panning shot emphasises the diversity of its constituent loops so that they do not fully merge into that space. Rather, these loops coexist, thereby asserting the extensive and intensive temporalities of the digital cultural experience. This metamorphosis of the individual spatio-temporalities of each loop into the consistent space and time of the panning shot, exemplifies the complexity of the digital aesthetics of continuity that Campanelli describes.

While Tanaka's juxtaposition of loops in *Kaizer* coheres within the principal panning shot of the park, Bergeron's horizontal stratification of loops in *LoopLoop* emphasises their independence from one another and so, immediately and explicitly fragments both space and time within the video's frame. According to this compositional strategy, each loop moves independently of, in different directions

from, and at different speeds to, the other loops with which it shares screen space. The variability of space and time modelled by the video is a key aspect of the digital technological forms and experiences that comprise digital culture.

Considering the impact of the use of digital technologies in contemporaneous cultural practices, Holtzman argued that: 'Ideas conceived in digital terms take shape in nonlinear forms' (1998: 168). Here, he traces a conceptual link (as his contemporary, Kim Cascone, similarly did in relation to musical composition)[147] between the technological environment and the emergent formal strategies of digital creative practice. Again, it is important to be clear on the theoretical ramifications of Holtzman's position: he does not suggest in his work that nonlinearity is exclusive to the digital domain. It would be a straightforward process to construct a counter-argument to this position: creative practices in non-linearity, which transcend the *beginning, middle, end* structure of linear narratives and processes, can be found throughout the history of the arts.

Non-linearity has been explored throughout the pre-digital period of film, for example, in films such as *Intolerance* (1916) by D. W. Griffith, *Un Chien Andalou* (1929) and *L'Age d'Or* (1930) by Luis Buñuel, *Hiroshima, Mon Amour* (1959) by Alain Resnais and *The Conformist* (1970) by Bernardo Bertolucci. Rather, the non-linearity of digital worlds is, for Holtzman, the aesthetic expression of ideas that emerge from the particular experiences of engagement with the digital network. Non-linearity as a general category can be found throughout creative arts practices - indeed, analogue film and digital audiovisuality are merely two fields in which non-linear practices can be found. What is key to Holtzman's analysis is the specific cultural-

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[147] See Chapter 3 of this thesis.

political and technological context from which such non-linear impulses spring, and how they in turn express those specificities of the digital experience.

The formal, conceptual and narrative implications of the variable, multiple and simultaneous spatio-temporalities of the videos under analysis are similarly considered from the point of view of the technocultural context within which they have emerged. This is key to the current research project as a whole - while features similar to the glitch, the loop, the interface and the database can be found throughout creative arts practices, these four formal elements of digital audiovisuality are of particular interest in this study because of their conceptual specificity to the technocultural context from which they have emerged, and their potential to introduce the discourses and ideas that spring from digital culture into the online video narrative.

LoopLoop takes an explicitly non-linear form, in both spatial and temporal terms (linearity in audiovisuality is both spatially and temporally significant – the sequential replacement of shots according to the rules of continuity in conventional audiovisual narrative is designed to maintain both the spatial and temporal cohesion of the narrative). As a result, *LoopLoop*'s composition of a varying number of spatio-temporally independent loops responds to, and articulates, the spatio-temporal multiplicity, simultaneity and variability that has been introduced by digital technologies to the creative production environment and, more generally, to our shared cultural environment. The diversity of spatio-temporalities that the video models conceptually implicates our experiences of interaction with, and through, digital technologies, in the video's narrative.

Munster's research elucidates the conceptual significance of our engagement with, through, and in, digital space. She argued for the (approximate) aesthetic – rooted in the experience of interactivity – as the 'plane of experience which allows for

the intersection of the force a sense impression exerts upon the body to a mediated reflection upon this and of course the continual movements between these [which] would not distinguish between experience and contemplation of that experience as two operations springing from different faculties' (Munster 2001). Her assertion of the digital aesthetic as a negotiation between human, technology and the digitally mediated artwork/object/interface, establishes the conceptual impact of digital technologies on our experiences of, and in, digital space. She added: 'Living life under the sign of the digital is about the emergence of a spatiality and duration in which relative speeds and differential relations are foregrounded in embodied experience' (Munster 2001). As digital technologies have become pervasive in contemporary culture, we increasingly engage in the type of embodied experience that Munster describes. Consequently, we are habitually exposed to the relative and differential spatio-temporalities of digital space that are specific to the digital cultural experience.

Bergeron's composition of loops emphasises the differential and relative spatio-temporalities that comprise *LoopLoop* by horizontally stratifying them on screen where their relative difference is highlighted by their close on-screen proximity. As a result, these loops draw the conceptual implications of spatio-temporal multiplicity, simultaneity and diversity, which are specific to the digital cultural experience, into its audiovisual narrative.

The spatio-temporal composition of *Metro: Paris - Hong Kong underground* also enables us to perceive the multiple spatio-temporalities that digital technology has introduced to contemporary culture and thus, to consider the digital systems that underpin it.

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In its imbricated composition of the loop, *Metro: Paris - Hong Kong underground* extends the space of the screen beyond that of the previously discussed videos. The formal construction of *Kaizer* and of *LoopLoop* emphasise the multiplicity, simultaneity and diversity of the temporalities or spatio-temporalities, respectively, that occupy the space of the screen, modelled as a level plane. Their multiple and variable temporalities or spatio-temporalities coexist within this level plane and are juxtaposed on screen in a form of dynamic collage, or horizontal stratification, respectively. By contrast, *Metro: Paris - Hong Kong underground* emphasises the depth of the screen by layering loops of footage that were shot on location.[148]

While the video's imbricated spatio-temporal construction of loops denotes a primarily spatial condition, it is important also to note the implications of such spatial layering for the video's construction of time. Its imbrication of spatio-temporal loops through the depth of the screen layers the individual temporalities contained within those loops, thereby emphasising their temporal disparity. This is further emphasised by the video's layered, temporally offset repetition of loops of duplicate footage.

Campanelli finds the 'aesthetics of repetition' fundamental to digital technology and culture: 'The constant repetition of content across the Web is particularly evident in the practice of reblogging, in which a blogger re-publishes the content of another blog' (2010: 197). (My reposting of all of the videos examined in this thesis on my research website: http://digitalaudiovisuality.com, is an example of Campanelli's aesthetics of repetition.) Another example, the viral video sub-genre of the meme – outlined in the Introduction to this thesis – is deemed viral according to the extent of its repetition, being widely re-posted, or made available elsewhere on the

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[148] 'On location' is a term used in audiovisual practice in order to distinguish field recording, or that which *is not* shot in a studio, from that which *is* shot in a studio.

digital network, thereby repeating the same video content. The immediate and almost constant repetition of loops in *Metro: Paris - Hong Kong underground* models Campanelli's 'aesthetics of repetition', thereby implicating the temporal significance of our experiences of engagement with digital technology in the video's narrative.

Occupying the other extreme – in terms of spatio-temporality – the piano interlude in the middle of the video is accompanied by a montage of still images. The explicit contrast between the significantly limited spatio-temporality of the video's still images and the comparatively extensive spatio-temporality of its loops, accentuates the multiplicity and variability of spatio-temporalities that this video models.

If we apply Fiske's theory on media convention – discussed in Chapter 3 – to the spatio-temporal loop's subversion of conventional audiovisual linearity, we can further appreciate the conceptual significance of the spatio-temporal compositional strategies of *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground*. By subverting the conventions of audiovisuality, the spatio-temporal loop allows us to perceive both the agency, and the experiential specificities, of the technologies involved. As already noted, Fiske allied convention with ease of communication. Again, I would argue that the formalisation of the spatio-temporal loop in these videos, rather than impeding communication, in fact, communicates the conceptual significance of digital technologies in contemporary digital cultural experiences. By formally articulating the spatio-temporal multiplicity, simultaneity and diversity that are key to our experiences of digital technology in the frame of the video, the loops in *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* introduce the conceptual implications of those experiences into the audiovisual narrative.

4.5   Loop narrative

The spatio-temporal composition of loops in *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* draw the spatio-temporal specificities of digital technology and the conceptual implications of these specificities, which underpin and shape our experiences of digital culture, into the audiovisual narrative. The videos' narratives, which integrate footage of various aspects of urban life with the spatio-temporal specificities of digital technology, articulate how digital technologies impact contemporary lived culture.

In order to attend to the conceptual complexity that the loop generates in the narratives of these videos, I employ a theoretical model of analysis that incorporates aspects of existing research into the spatial and temporal specificities of cultural experiences that are mediated by digital technologies. Holtzman's theory of the impact of these specificities of digital technologies on future media narratives in *Digital Mosaics: The Aesthetics of Cyberspace* (1998), paves the way for the analysis undertaken. In *Time and the Digital: Connecting Technology, Aesthetics, and a Process Philosophy of Time* (2012), Tim Barker helpfully illuminates the multi-temporal configurations of experience that digital technology has introduced to contemporary culture. In light of Munster and Murray's research into digital aesthetics, which has illuminated the temporal *and* spatial specificities of interactivity, I expand Barker's theory of the time of the digital to include its necessary spatial counterpart. In addition, William J. Mitchell's research in *Placing Words: Symbols, Space and the City* (2005) usefully theorises the cultural impact of the technological systems that underpin urban spaces. These studies offer a range of concepts that are key to understanding the narrative significance of the loop in these videos.

Kaizer, *LoopLoop* and *Metro: Paris - Hong Kong underground* formally integrate spatio-temporal loops with live action footage of aspects of urban life, producing narratives that enable us to perceive and thus, to consider, the digital mediation of these videos *and* of the lived cultural experiences that they portray. These videos formalise the spatio-temporal multiplicity, variability and simultaneity that digital technology has introduced to contemporary culture in order to produce innovative audiovisual narratives that relate the conditions of our lived culture, which is increasingly mediated by such technologies. Rooted in the spatio-temporal loop, the videos' narratives articulate the increasing interrelation of virtual and physical space, and of human beings and digital technologies, which defines the experiences of contemporary digital culture.

Tanaka uses a public park as the setting for *Kaizer*, within the space of which he composites an increasing number of independently operating spatio-temporal loops. Creating these loops out of footage of park users, he creates cycles of their movement whereby they behave in an unusual and erratic manner. Some users walk backwards, others walk forwards and others remain static, all according to diverse speeds. As a result, the park users' behaviour adopts a mechanistic or technological appearance. The strangeness of their movements and behaviour is further compounded by Tanaka's composition of these loops within the video's principal panning shot. Following this compositional strategy, he formally emphasises the difference between the consistent space and time of the public park and the diverse temporalities of the loops of human movement that coexist within that space.

The video's formal articulation of the diversity of its temporalities is further emphasised by Tanaka's desynchronisation of sound and image throughout the video.

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While both image and sound are subjected to a similar looping strategy, they are treated as individual elements in this video and thus, operate independently of each other. As the visual loop visually models the specificities of the video's mediating technology, its sonic counterpart further foregrounds the specificities of this underlying technology by foregrounding typically background sound through the loop. These loops both sonically and visually establish a relation between the foreground and the background of the video, where its underlying technologies form part of its narrative.

Echoing Virilio's theory of the coexistence of extensive and intensive temporalities in digital culture, Tim Barker notes how:

> the multi-temporality of the digital presents an alteration to the way we experience the occasions and events of our everyday lives, beyond a chronological sequence of events. In other words, the different modes of organizing information and constructing meaning afforded by the organizational and generative processes of the digital may provide us with opportunities to experience life differently – to experience life and aesthetics as a set of processes supplemented by technological mediations. (2012: 15)

Tanaka's composition of loops in *Kaizer* articulates the multiple temporalities that Barker (and Virilio) found specific to the experiences of digital culture. By subverting the typical behaviour of the park users' through the loops, making their behaviour seem mechanical, the video's narrative articulates how contemporary urban life has become mediated by digital technologies.

Kaizer foregrounds the typically underlying, or background, digital technologies of mediation through sonic and visual loops that formally articulate the temporal multiplicity, variability and simultaneity that is specific to those technologies. By integrating these specificities of digital technology with the behaviour of the park users, the loops in *Kaizer* articulate the experiences of temporality that are specific to contemporary digital culture. For example, in an

urban park such as the one depicted in the video, the extensive time of the physical space of the park becomes integrated with the intensive time (multi-temporality) that digital technologies, such as mobile digital devices and the Wi-Fi[149] digital network, introduce to that space. Through their integration, we experience contemporary digital culture as the coexistence of multiple temporalities. *Kaizer* enables us to perceive, and therefore to consider, the impact of the intensive time of digital technologies on the extensive time of our lived spaces.

The cultural impact of digital technology's integration of extensive and intensive time is also articulated in *LoopLoop*'s narrative, whose live action footage of the city is transformed by the spatio-temporal variability of the loop. The images and sounds that are contained within the video's loops and that we see and hear, as if travelling by train, are distinctly urban: shutters, apartment buildings, roofs, gates, balconies, barred windows, traffic, level crossings teeming with impatient pedestrians, and so on. As a result of the video's spatio-temporal composition of loops of such footage, our narrative journey past those urban scenes constantly oscillates between progressive and regressive movement and between wide-shot and close-up. Bergeron's compositional strategy, according to which a varying number of stratified loops coexist on screen, emphasises the diverse and variable spatio-temporalities of those journeys through urban space and the simultaneity of the individual scenes that each loop reveals.

Using the audiovisual analogy of the train, *LoopLoop* composites a number of individual train journeys simultaneously on-screen, and thereby formally articulates the co-existence of an abundance of lived experiences that comprise the city at any one time. The video's narrative relates the abundance and simultaneity of individual

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[149] Wi-Fi is a wireless networking technology that uses radio waves to provide wireless high-speed Internet and network connections.

(in the video's lingering shot of the domestic ritual, for example) and collective (in the video's lingering shot of the level crossing, for example) social and cultural experiences that the city holds, in association with the experiential spatio-temporal diversity that is a feature specific to digitally mediated culture.

LoopLoop's narrative arrangement of those individual, yet coexisting, loops of urban footage asserts the spectrum of fracture, multiplication and simultaneity of space and time that has been made possible by digital technology. For example, towards the end of the video the 'camera' zooms in and a single loop occupies the screen. The loop comes to a stop and we can see a wheelhouse of rotating pulleys, on which some of the images of the video have been superimposed, resembling strips of film running off large spools. The loop mobilises again, moving rapidly in reverse, while the 'camera' zooms out to reveal four stratified loops, all of which slow down to such an extent that the moving images that they contain are fragmented into a series of frames, or still images. Soon, the loop mobilises again, and the 'camera' zooms out so that a number of loops share the screen once again, moving at different rates to each other and in different directions. This interlude in the video's loop composition highlights the spatio-temporal diversity that digital technology has introduced to urban experiences.

Holtzman's research explored the kind of ideas which, he argued, only digital technologies were capable of expressing, and consequently identified the modes of interaction and correspondingly, the ways of thinking, that had emerged from the 'digital mosaics' of digitally mediated culture. He argued that: 'non-linearity is permeating all parts of our culture,' predicting that: 'Soon we will no longer expect a beginning, middle, and end. Instead, we will expect the freedom to jump in a discontinuous fashion from idea to idea, independent of the constraints of space and

time' (Holtzman 1998: 171; 172). Assumptions about what we might collectively expect from media culture aside, Holtzman presciently considers the future impact of spatio-temporally discontinuous experiences, which had been introduced to digital culture by the hyperlink, on media narrative. *LoopLoop*, and indeed, *Kaizer* and *Metro: Paris - Hong Kong underground* demonstrate how the spatio-temporal specificities of digital technology can be formally articulated in the video text to produce innovative audiovisual narratives.

Through the loop, Bergeron models the spatio-temporally discontinuous, multiple, variable and simultaneous experiences of contemporary digital culture, producing a narrative that relates the impact of digital technologies on our lived social and cultural experiences. His formal references to camera operations and to the digital technologies of the video's mediation introduce the concept of mediation – which is emphasised by the video's 'media wheelhouse' interlude – to the video's narrative. Modelling an abundance of live action footage of life in urban spaces through a varying number of spatio-temporally variable progressive and regressive loops, Bergeron formally asserts the significance of digital technological systems in urban life. His formal integration of the spatio-temporal specificities of the technologies underpinning the video and the scenes of urban life that it depicts, draws our attention to the technological systems that similarly underpin the urban environment. As a result, *LoopLoop*'s narrative relates the impact of digital technologies in urban environments and consequently, on our experiences therein.

Metro: Paris - Hong Kong underground presents, through imbricated spatio-temporal loops, live action footage of commuters moving through the underground rail systems of Paris and Hong Kong. In so doing, it integrates human behaviour with the spatio-temporal specificities of digital technology, the technology that underpins

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this video and the cultural experience that it depicts. Formally interrelating digital technology with the human being in this way, the video's narrative relates the impact of digital technological systems on the movement and behaviour of human beings in contemporary culture.

The architect and urban designer William J. Mitchell points out: 'cities operate as huge machines for sorting their populations and organizing opportunities for face-to-face encounter and exchange' (2005: 7). The technological systems that underpin cities facilitate urban culture, so that these systems can be understood as the mediators of urban living. The video's short duration spatio-temporal loops readily convey the cyclical nature of commuter culture by making the commuters' behaviour mechanical, fragmented and repetitive. The imbrication and repetition of those loops articulates the intense repetition that commuting involves, by multiplying the minutiae of their journeys on screen. The imbricated loop magnifies the monotonous regularity of commuter journeys and emphasises the mechanistic behaviour that commuting involves, thereby illustrating the relation of urban dweller to the technologies that drive urban systems.

It is important to note that the video's eponymous cities, Paris and Hong Kong, could not be connected by an underground rail system; rather, the global digital network facilitates their connection. This fact is fundamental to understanding the discursive implications of the video's narrative. Its on-screen looped repetition of scenes from the underground rail system relates the spatio-temporal experiences that are specific to our experiences of engagement with digital technology to the behaviour and movement of those involved in commuter culture. Using this visual analogy, the narrative of *Metro: Paris - Hong Kong underground* relates the experience of commuter travel, which is characterised by the habitual engagement

with the underground rail network, for example, with the network of digital technologies that is similarly habitually engaged throughout contemporary digital culture. As the underground rail system mediates our experiences of commuter culture, so digital technologies mediate our experiences of interaction in, and with, all aspects of contemporary digital culture.

Tim Barker asserts the time of interactivity 'as a thickening duration in which multiple scales of time exist simultaneously. It is this coexistence of differentiated scales of time that inflates the viewing present, and this is precisely how the digital encounter may alter our experience of time' (2012: 15). In light of Munster and Murray's elaboration of the temporal *and* spatial significance of the interactive experience, it is feasible to expand Barker's theory to include the spatial as well as the temporal specificities of digital technologies. Accordingly, we can appreciate how the experience of interactivity comprises 'differentiated scales of time' *and* of space. For example, the multiple open tabs of the Internet browser, through which we gain access to their individual configurations of space and time, enable us to interact with, and so to experience, their differentiated scales of time and space.

The differentiated scales of time and of space that comprise our experiences of interactivity are key to the discursiveness of the loop in *Metro: Paris - Hong Kong underground*'s narrative. The formal coexistence of differentiated scales of time and space within the video – through imbricated and repeated loops of footage and still imagery – models the diversity of spatio-temporalities that our engagement through, and with, digital technologies has introduced to contemporary culture. Bergeron's composition of loops of live action footage and still imagery shot in Paris and Hong Kong narratively asserts, through its assertion of the multiple, simultaneous and diverse spatio-temporalities that are specific to digital technologies, the digital

technology through which these urban centres are actually linked. The narrative's interrelation of the specifically digital simultaneous coexistence of different scales of time and space, with the movement and behaviour of people engaged in commuter culture – and analogically, in network culture – articulates how human behaviour in contemporary digital cultural and social experiences is mediated, and therefore influenced, by digital technology.

<u>Conclusion</u>

Holtzman asserts in the epigraph to this chapter that: 'the nonlinear nature of digital worlds is part of digital expression' (1998: 168). The analysis undertaken in this chapter has examined the technological, formal, conceptual and narrative implications of the fundamental non-linearity of digital technologies, as articulated in the spatio-temporal composition of loops in the videos selected.

Kaizer, *LoopLoop* and *Metro: Paris - Hong Kong underground* are underpinned by the looped iteration of computer programmes that control the function of their underlying digital data. They exploit the mutability of that data, which underpins the technologies of the screen and those of the production of sound, to produce innovative audiovisual configurations of the loop that formally express spatio-temporal complexity. These videos model the spatio-temporal multiplicity, variability and simultaneity that the mediation of contemporary culture by digital technology has introduced to its forms and experiences. By coherently comprising diverse articulations of space and time, these videos mirror the diversity of spatio-temporalities that likewise cohere in the digital realm.

The videos demonstrate a number of compositional strategies, according to which, the spatio-temporal complexity specific to digital technology and culture is formally expressed. *Kaizer*'s dynamic collage of loops asserts their spatial continuity within the space of that video's overarching panning shot, while it simultaneously emphasises the diversity of their variable temporal aspects. The sonic loops of its soundtrack echo its visual articulation of temporal variability. *LoopLoop*'s stratified composition of loops emphasises the individuality of their spatio-temporalities through their on-screen relation, which likewise asserts the video's spatio-temporal diversity. In its soundtrack the sound of a train plays forward and backwards, in

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concert with the visual movement of the loops. The imbricated composition and repetition of short duration loops in *Metro: Paris - Hong Kong underground* produces a sequence of rapidly alternating loops of images. The spatio-temporal diversity that their composition through the depth of the screen produces, is echoed by the soundtrack's use of similarly short duration sonic loops. Sound is largely desynchronised from the image in these videos, but the similar treatment of sound and vision in their production compounds the spatio-temporal complexity that they model.

While each of these videos tends to emphasise particular aspects of the spatio-temporal complexity of digital technologies and culture – temporal diversity, variability and simultaneity (*Kaizer*), spatio-temporal diversity, variability and simultaneity (*LoopLoop*), and the spatial articulation of temporal diversity, variability and simultaneity (*Metro: Paris - Hong Kong underground*) – they nonetheless involve common features. In the analysis I concentrated on the key formal emphases of each video in order to trace a clear conceptual path through their formal, conceptual and narrative complexity. It is important to note that the repetition that I discussed in detail in reference to *Metro: Paris - Hong Kong underground* can also be found in the other two videos. Also, the chiefly temporal aspects of the loop that I discussed in reference to *Kaizer* are relevant to the other two videos. In addition, the spatio-temporal diversity produced by the relative on-screen association of loops that I discuss in relation to *LoopLoop* can be found in the other two videos. Also, all of the videos include still imagery. While I have followed an analytically prescriptive methodology for the purposes of logical clarity, similar formal articulations of spatio-temporality can be found throughout the sample of videos.

What sets their similar formal articulations of spatio-temporality apart is their narrative operation, in which loops interrelate with other audiovisual content. In

Kaizer Tanaka manipulates the behaviour and movement of park users through a number of loops that coexist within the video's principal panning shot, which traces the spatio-temporal consistency of the park. The coexistence within the video of multiple temporalities of human behaviour within the consistent space and time of the park articulates the coexistence of multiple temporalities that is specific to digital cultural experiences. *Kaizer*'s narrative enables us to perceive the impact of the multiple temporalities of digital technologies on the consistent time and space of the lived world. In *LoopLoop* Bergeron uses the sonic and visual analogies of the train to emphasise its unusual variable (progressive or regressive) movement through the loop. By modelling a specifically digital spatio-temporal condition – which is at once multiple, diverse and variable – through which we observe a varying number of simultaneously occurring urban scenes, its narrative relates the impact of digital technologies in the urban environment and our experiences therein. In *Metro: Paris - Hong Kong underground* Delalex, Moreau and Wessel-Cessieux's imbrication of loops distributes diverse spatio-temporalities through the depth of the screen, through which the actions of the commuters using the rail system are layered and repeated. The video's titular linking of Paris and Hong Kong analogically refers to the digital network whereby these urban centres are actually linked. Its narrative interrelation of diverse scales of time and space with urban scenes articulates the impact of digital mediation on contemporary cultural experiences.

As the foregoing analysis has shown, the technological, formal, conceptual and narrative specificities of the loop cannot be approached or understood as isolated elements of the video text. Rather, their various significances in the videos examined are contingent on one another. For example, our encounter with the multiple, variable and simultaneous spatio-temporalities of digital technology and culture reveals these

specificities of digital technology to us. Our engagement with the loop formally asserts these specificities, which, given the cultural context of our encounter with the technological and formal specificities of digital technology, produce a number of conceptual connotations that derive from our engagement with the diverse spatio-temporalities of digital technology.

While the technological, formal, conceptual and narrative implications of the loop in the videos studied are interdependent and defined in relation to one another, I have attempted in this chapter to trace a logical path through their definition and analysis. The necessary and inextricable interrelation of those implications of the loop in the videos reveals one aspect of the digital audiovisual medium, which itself comprises the interrelation of the technological, formal, conceptual and narrative implications of the glitch, the loop, the interface and the database as they are articulated in contemporary online video.

Chapter 5:   Interface

...the interface is now a central aesthetic form conveying digital information of all kinds [...]
that offers a new way to understand digital art in its various guises, [...] providing us with the
possibility of discussing contemporary reality and culture as an interface culture.

Søren Pold
'Interface Realisms: The Interface as Aesthetic Form' (2005)

The digital interface is an essential aspect of digital culture, enabling our interaction,

in the lived world,[150] with the virtual spaces and objects of the digital realm. Critical

analyses of the interface have been fundamental to theorisations of digital

technological specificity since the inception of digital media scholarship. The

interface was a central concern in Stephen Johnson's research into the cultural

ramifications of the early Internet, which noted: '...we live in a society that is

increasingly shaped by events in cyberspace, and yet cyberspace remains, for all

practical purposes, invisible, outside our perceptual grasp. Our only access to this

parallel universe of zeros and ones runs through the conduit of the computer interface,

[...] the most dynamic and innovative region of the modern world' (Johnson 1997:

19).

Although often attributed to the first *Apple Macintosh* (128K) personal

computer in 1984, the Graphical User Interface (GUI) was a key innovation of *Xerox*

Star in 1981, building on the work done at *Xerox Parc* with the *Xerox Alto*, the first

true GUI machine in 1972. The *Apple Lisa* (1983) was the first *Apple* machine to

have a GUI, which was quickly replaced by the *Apple Macintosh*. The GUI replaced

the typical command-line interface of earlier computing systems, such as *Apple*

DOS,[151] which required that the user interact with computer systems through text-

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[150] I use this term to differentiate the realm of the lived experience of the inherent body from the virtual
realm produced by digital technologies. Our embodied relation to the lived world formed the basis of
Maurice Merleau-Ponty's *Phenomenology of Perception* (1945).
[151] *Apple DOS* was the family of disk operating systems for Macintosh's *Apple II* series of
microcomputers from 1978 to 1983.

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based commands. The GUI revolutionised computer culture by promoting a more user-friendly computing experience, whereby the user directly engaged with on-screen graphics (or icons) that signified locations on the computer's hard disk: its software or directory, for example.

The invention of the GUI marks a pivotal moment in the development of digital technologies, in which user experience began to influence their design. Heretofore the non-intuitive textual commands of computer programming required that the computer user translate their instructions into machine-readable form. The GUI and subsequent manifestations of the interface introduced an intermediary between machine code and the human user whereby these virtual and organic systems could exchange concepts through mutually comprehensible computer icons.

Today, the interface intercedes between the user and the computer throughout digital culture, in personal computing – using computer icons such as the mac operating system's *Finder* icon (Fig. 5.1), for example, to access a computer's file directory, and in interactivity with network technologies such as the Internet – using the *Firefox* web browser interface (Fig. 5.2), for example, to access files archived in the digital databases that underpin the Internet.

Fig. 5.1 mac OS *Finder* icon   Fig. 5.2: *Firefox* web browser interface

The concept of the interface as the threshold to a space beyond the lived world is not exclusive to digital culture, having already emerged as an essential feature of theatre – in the proscenium, according to which, the space occupied by the audience was distinguished from the fictional space of the play, and as an essential feature of

film – in the film frame that correlates to the space of the screen, according to which, the space occupied by the audience is separated from the fictional space of the film's diegesis. Beyond simply separating fictional space from that of the lived world, the digital interface serves as a threshold to a virtual world beyond the one that we physically occupy, whose spaces, temporalities, content and functions are nonetheless made accessible to us through the digital interface.

Manovich recognised this expanded significance of the interface in digital culture, which formed one of the lexical units of his language of new media – a hybrid of computing and cinematic languages. He identified how: 'The window in a fictional world of a cinematic narrative has become a window in a datascape [*sic*]. In short, what was cinema has become human computer interface' (Manovich 2001a: 86). The confluence of computing and cinematic languages that he found in millennial digital media has developed and extends into the contemporary digital arts, where the interface has emerged as a feature of contemporary online video.

A key feature of digital technologies and culture, the interface offers, as Søren Pold asserts in the epigraph to this chapter, 'a new way to understand digital art in its various guises,' and provides us 'with the possibility of discussing contemporary reality and culture as an interface culture' (2005: 2).[152] The recent online videos, *zZz | Grip* (2007) by Roel Wouters, *Moonwalk* (2008) by Martin Kohout and *Noteboek* (2008) by Evelien Lohbeck[153] feature the interface. I have selected them from the contemporary field of practice in order to explore how their formalisations of the interface introduce its technological, conceptual and thus, technocultural, specificities to audiovisual narrative. These videos offer innovative ways to perceive the significance of the interface in contemporary digital culture and its impact on our

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[152] As this journal, *Postmodern Culture*, is an e-publication, only paragraph numbers have been provided. In-text citations for Pold's article refer to paragraph, not page, numbers.
[153] These videos are available to view at: http://digitalaudiovisuality.com/interface/.

cultural experiences. Accordingly, the interface offers a way to understand – or provides a methodology of analysis for – digital audiovisuality.

Due to its centrality in all aspects of digital culture, understood in terms both of cultural production, such as the digital arts, and of social engagement, such as social media, and in respect of each scale of these processes, from personal computing to networked culture, the interface has practical and conceptual significances. The videos were selected for analysis because while they each comprise distinct formal strategies according to which the interface is audiovisually rendered, they nonetheless cohere in their narrative articulation of aspects of the technocultural role of the interface in contemporary digital culture.

In this chapter I critically analyse the formal, conceptual and narrative implications of the interface in the selected videos in order to establish how their assimilation in audiovisuality articulates the technocultural significance of the interface in contemporary digital culture. Following a methodology of close textual analysis, I establish how their formalisations of the interface assert its inherent and technological specificities, interrelating its conceptual implications and the other content of the videos to produce narratives that are specific to, and discursive of, contemporary digital culture. Their analysis employs a theoretical model that combines aspects of established digital arts scholarship on the inherent, technological, conceptual and cultural specificities of the interface, and is illuminated by existing research into the visual and sonic modelling of virtual and lived spaces.

Section 5.1, 'Creative context of the videos selected for analysis', establishes the context of the videos analysed, in terms of their relation to the formal or thematic trends within the bodies of work of the artists responsible.

Section 5.2, 'Audiovisual formalisations of the interface', addresses the formal construction of each of the videos from the perspective of the inherent specificity of the interface – outlined by Stephen Johnson in the first paragraph of this chapter – in terms of its facilitation of the paradoxical relation of, and interaction between, the virtual and lived worlds, which nonetheless remain distinct from one another.

The analysis undertaken in section 5.3, 'Formal interface and technology', employs a theoretical model generated from aspects of existing scholarship, which has engaged the technological specificities of the interface, digital form and aesthetics, and the sonic construction of space. It integrates Binkley's theorisation of the technological origins (1990a) and future cultural impact (1990b) of the interface and Manovich's concepts of digital non-space and 'info-aesthetics' (2001a). Holtzman's analysis of the expression of digital processes in early digital art (1998) and Michel Chion's theory of the 'auditory frame' (2009), illuminate the formal construction of virtual space in the videos. Together, these aspects of their research illuminate the technological specificity of the interface as it is formally articulated in the videos.

In section 5.4, 'Conceptual implications of the formal interface', the analysis is informed by Munster's 'approximate aesthetics' – a theory of the liminality of the virtual and digital realms in interactivity (2001), Murray's aesthetics of 'incompossibility' (2000) – a theory of how these realms affect, but nonetheless remain distinct from, one another in interactivity and Hansen's theory of the user's enframing of the potentially limitless data of the virtual realm (2004) in such processes. Virilio usefully theorises the spatio-temporal specificities of experiences of interactivity that integrate the lived and digital realms (Armitage 2001). The combination of these aspects of existing scholarship illuminates the experiential and

thus, conceptual, implications that the digital interface has introduced to contemporary digital culture.

In section 5.5, 'Interface narrative' the analysis of the narrative significance of the formal interface in the video selected employs a theoretical model that incorporates existing scholarship into the aesthetics, psychology and philosophy of interaction. The model appropriates Pold's theory of the discursiveness of the interface in digital art (2005), Tim Barker's philosophy of the experience of interaction through the digital interface (2011c) and André Nusselder's psychological interpretation of the interface's mediation of the 'virtual' and the 'real' (2009), in order to attend to the conceptual complexity of the narrative operation of the interface in the videos.

Rather than being selected for discussion simply because they formalise the interface, *zZz | Grip*, *Moonwalk* and *Noteboek* demonstrate the conceptual complexity that their formalisations of the interface introduce to online video which, when considered in terms of their relation to the other aspects of these videos, produce innovative audiovisual narratives. The conceptual implications of the formal interface derive from experiences of engagement through various manifestations of the interface throughout digital culture, and likewise inform its narrative operation in these online videos.

zZz | Grip involves the human performance of digital operations within an interface, which is formalised through a combination of lived world beings, objects and spaces. Using human beings and the objects and spaces of the lived world to enact digital technological processes this video articulates how, in processes of interactivity, the actions of human beings are circumscribed by the parameters set by the functions made available to them by the interface. The video's on-screen

cooperation of, and negotiation between, human beings and the commands, operations and functions of digital technologies narrativises the processes of interactivity that take place through the interface.

Moonwalk's formal recursion of the informational aspects, rather than the content, of the *YouTube* interface against the indeterminate space of the virtual realm emphasises the technological means whereby the lived and virtual realms can interact. By formally emphasising the interface – the liminal space between these realms – this video conceptually associates the lived world and virtual counterparts of interactivity. The video's duration of two-minute twenty-seconds is foregrounded in the timeline of its first image of the interface that reflects that of the *YouTube* interface on which the video plays. Its narrative thereby articulates the human enframing of digital data that is central to processes of interactivity.

Noteboek's formal appropriation of the *YouTube* interface comprises four video clips in which virtual objects interact with the objects and beings of the lived world. By structuring the succession of these video clips according to Lohbeck's on-screen selection of them through the interface, this video establishes, by reference to this digital technology, a conceptual frame within which the interaction of the lived and virtual worlds in these video clips can conceivably occur. The video's narrative relates Lohbeck's selection of video clips and the content of their individual narratives, both of which model the complex negotiation between, and interaction of, the lived and virtual worlds that characterise the interactive process.

5.1   Creative context of the videos selected for analysis

Prague-born artist Martin Kohout's independent digital audiovisual practice largely centres on the personal video diary aesthetic that emerged in response to the advent of amateur video broadcast websites, such as *YouTube*. His video *Moonwalk* (2008) initiated a body of work in which he audiovisually explores the interaction between the personal and digital realms in experiences of cultural engagement through the *YouTube* interface. Whereas *Moonwalk* explores how the limitlessness of virtual data is enframed by our personal experience of, and interaction with, that data through the interface, the videos that followed focused solely on the enframing body – specifically *his* enframing body – in a series of 821 online videos called *Watching Martin Kohout* that recorded every instance that he viewed videos on *YouTube* between April 2010 to March 2011.[154]

The Dutch artist Evelien Lohbeck's digital audiovisual practice-based research is concerned with the interchange between the virtual and the lived worlds, and between fantasy and reality, which are fundamental to the experiences of contemporary digital culture. Her video *Noteboek* (2008), which explores the interaction of virtual and lived world objects on video and through the *YouTube* interface, was her graduation project for the *Academy of Art and Design St. Joost*. After graduation she became an artist-in-residence at the *Netherlands Institute for Animation Film*.[155] As an artist-in-residence she followed *Noteboek* with a number of thematically related videos in which she explored the interrelation of fantasy and reality in *Genetically modified kiwi* (2011), *Playing with cheese* (2011) and *Genetically modified apple* (2011), for example.[156]

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[154] *Watching Martin Kohout* is available to view at: www.youtube.com/user/martin0kohout#p/u.
[155] *Netherlands Institute for Animation Film* ceased operating in November 2013.
[156] Evelien Lohbeck's work is available to view at: http://vimeo.com/evelienlohbeck.

The Dutch digital video artist, Roel Wouters, has produced a number of transdisciplinary online videos that variously incorporate live performance, typography, 3D modelling, animation and networked collaboration.[157] Exploiting the mutability of digital data, his video practice explores the multiplicity of media types and experiences that digital technology has introduced to contemporary culture. *zZz | Grip* (2009), his music video for *zZz*'s song 'Grip', formally interrelates virtual and lived world processes through the human performance of the interface and its associated digital functions and commands. This formal interrelation of the virtual and lived world components of digital culture features throughout his work, for example, in his videos *Robot High School* (2007) and (in collaboration with Luna Maurer) *Tape is made from trees* (2009), and in his later crowd-sourced collaborative digital video project *Now Take a Bow* (2010) that was made in celebration of the 10 year anniversary of *KORT!*.[158]

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[157] Roel Wouters' work is available to view at: http://roelwouters.com.
[158] KORT! is a Dutch short film production initiative for young screenwriters and filmmakers.

5.2 Audiovisual formalisations of the interface

Stephen Johnson identified the inherent specificities of the interface as the threshold to the virtual realm that facilitates our engagement with this realm, from the lived world. Formalising the interface, *zZz | Grip*, *Moonwalk* and *Noteboek* audiovisually model the reciprocal relationship between human and technology, the connection of the lived world to the virtual realm, and the exchange between them, which the interface facilitates in contemporary digital culture.
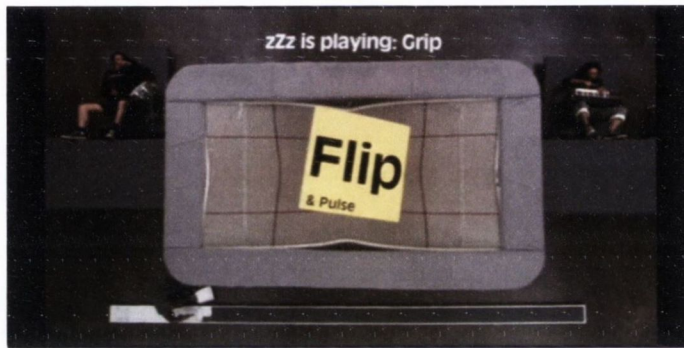
Fig. 5.3 *zZz | Grip* (2007) by Roel Wouters

In *zZz | Grip* Roel Wouters employs the live performance of human beings and props, shot from an aerial shooting position, in order to formally model a video streaming interface on screen. Through this live performance, which transposes digital technological operations to human performers in the lived world, the video formalises the interface through which human and technology can interact, through their on-screen interaction.
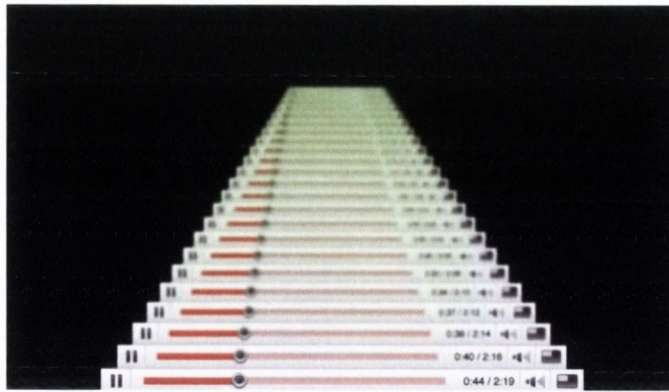
Fig. 5.4 *Moonwalk* (2008) by Martin Kohout

In *Moonwalk* Martin Kohout's audiovisual construction of the interface uses video and digital effects software to visually transpose the *YouTube* interface to the video and to reiterate a number of *YouTube* interface images through the depth of the screen. His formal transposition of the *YouTube* interface mirrors that of the actual *YouTube* interface through which this video streams. It thereby formally connects the lived world that we occupy as we view the video, with the virtual space that exists beyond the interface.
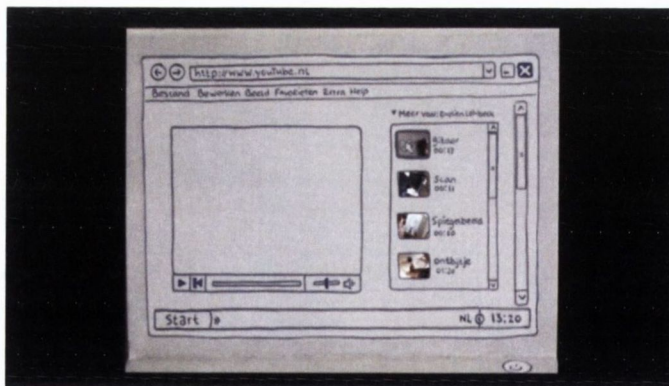
Fig. 5.5 *Noteboek* (2008) by Evelien Lohbeck

Evelien Lohbeck's *Noteboek* also appropriates the *YouTube* interface, rendered through hand-drawn animation. Four live action video clips[159] that consist of hybrid live action/animated elements are nested within this hand-drawn interface that

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[159] A video clip is a very short duration video. The popularity and production of video clips has increased in line with the development and democratisation of media production tools and technologies and distribution platforms, such as *YouTube*.

Lohbeck interacts with throughout the video. Enacting the constant interaction between, and co-existence of, the objects of the lived and virtual worlds and Lohbeck herself, this video implements the operation of the digital interface.

zZz | Grip is a music video Wouters made for the Dutch band *zZz* for their track 'Grip'. The live performance of human beings using props formally models an online video streaming interface through which the music video 'plays'. Wouters shot the video in a single take[160] that predominantly features (apart from the final hand-held shot)[161] an aerial shot[162] of the performance. From this aerial position the trampoline on which the performers perform looks like the 'screen' on a video-streaming interface. One performer remains on screen throughout the video, filling in the 'timeline' below the 'screen' using white paint.

The song that this video promotes appears to be played live by two musicians who occupy the left- and right-hand sides of the screen. As the song plays, successive trampolinists enter the frame and jump on the trampoline, holding cards that display specific functions or commands of a digital computer system: rotate/flip and I/O error,[163] for example, so that these functions and commands approach the camera lens and are clearly visible. Each trampolinist simultaneously performs the command or function that is visible on the card and is supported by other performers. For example, in the 'I/O error' performance, in addition to the trampolinist's performance, a person

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[160] A take in media production, particularly audiovisuality, is an instance of a continuous recording or shooting of a scene.

[161] Hand-held shooting is a technique of audiovisual production in which a camera is held in the camera operator's hands, rather than being mounted on a tripod or pedestal.

[162] Ariel shots are a technique of audiovisual production whereby the camera occupies an elevated position over the scene.

[163] Input/output (I/O) is the means by which a computer exchanges information with peripheral devices, for example, input devices such as the keyboard or the mouse, or output devices such as the display or the printer. Computer networking is a form of I/O.

enters the screen spinning a multi-coloured umbrella in order to mimic the spinning

wait cursor[164] that would typically accompany an I/O error.

This live performance was tightly choreographed in order to audiovisually

reproduce the video streaming interface and various digital functions and commands.

Consequently, *zZz | Grip* formally models the interface through a process that

involves the collaboration between virtual and human operations that the interface

facilitates in digital culture.

Within the screen of the actual *YouTube* interface through which Kohout's

Moonwalk streams, we can see an image that mirrors the *YouTube* interface and

likewise comprises a loading screen[165] and a progress bar.[166] The playhead[167] on the

progress bar of the interface image starts to move and simultaneously, the time

displayed on the right-hand side of the progress bar starts to increase. As the video

plays, more interface images, which are identical to the first, appear on screen.

Each successive interface image is imbricated over the preceding one, so that

it appears to be slightly further away, slightly smaller and at a slightly raised position

to it, and does not obscure the progress bars of the preceding interface images.

Kohout designed the interface images in such a way that each successive image

comprises a shorter duration that the one preceding it. This enables him to

choreograph the movement of the playhead on the progress bar of each interface

image so that they move across the screen from left to right, in unison with the other

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[164] Spinning wait cursor is the official term for the rainbow wheel that the pointer in Apple's Mac OS X (Operating System 10), for example, turns into when an application is not responding to system events.

[165] A loading screen is the image shown by a computer programme that indicates that the programme or file is loading or initialising.

[166] A progress bar is a component of a graphical user interface used to visualise the progression of an extended computer operation, such as in the case of *YouTube*, a video download.

[167] A playhead is a graphic line or button in the timeline that represents the position, or frame, of the audio or audiovisual material that is currently being accessed.

playheads of the other interface images. As a result, the playheads form a straight line from the bottom to the top of the screen, which moves across its width.

The video's soundtrack comprises a limited number of stark tones, echoing the minimalism of its visual counterpart.

Moonwalk's recursion of *YouTube* interface images through the depth of the screen emphasises the spatio-temporal multiplicity, variability and simultaneity of the virtual realm, which contrasts with the spatio-temporal coherence of the video itself, whose two-minute, twenty-second duration is indicated by the timeline of the *YouTube* interface through which we – in the lived world – view *Moonwalk*. Hence, its formalisation of the interface articulates the interface's mediation of these heterogeneous realms.

Lohbeck's *Noteboek* also formally appropriates the *YouTube* interface. It begins as a conventional live action video, showing a shot of a desk beside a wall, into which two hands holding a notebook enter. This shot is accompanied by the ambient sound of the room so that we can hear the movement of the hands on the notebook. Soon, the video's apparent fidelity to the lived world is subverted by the animation that begins to play in the open notebook, which now functions as a hand-drawn, animated laptop (thereby formally acknowledging the expanded meaning of the word 'notebook' in contemporary digital culture). The hands load the *Google* search engine interface on the laptop and use it to access the *YouTube* interface. The camera then zooms in on the *YouTube* interface so that it dominates the shot. It consists of an empty video player screen and to the left-hand side of the screen, four thumbnails[168] that denote the video clips that *YouTube* suggests for viewing.

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[168] Thumbnails are reduced-size images that appear on a media-streaming interface. They are derived from video files, for example, and are used in order to more efficiently visually organise, and thus, access the original files that they denote and are hyperlinked to. Thumbnails also feature in visual

These four video clips are successively accessed through the course of the video. Each one presents an activity that Lohbeck performs, involving a guitar, a mirror, a scanner/printer and a toaster, respectively. They present these activities though Lohbeck's innovative formal fusion of live performance and hand-drawn animation, which involves a combination of physical objects, such as the notebook, parts of Lohbeck's body, such as her hands and head, and virtual hand-drawn objects, such as the mirror and the guitar, which function as though they were physical objects.

Noteboek audiovisually models a constant interaction between Lohbeck, the objects of the lived world and those virtual objects that she has drawn, all of which takes place on her hand-drawn *YouTube* interface. The video formally models the communication and interaction between the lived and virtual realms that the digital interface facilitates.

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search engines, in image-organising programmes and in most operating systems or desktop environments.

5.3   Formal interface and technology

zZz | Grip, *Moonwalk* and *Noteboek* formalise the interface according to differing strategies that variously employ live performance, digital effects and animation. However, these videos are nonetheless related in their articulation, through their formalisations of the technological specificities of the interface and of the digital arts and online space. These formalisations of the interface articulate its liminality as the technologically mediated space between the lived and virtual realms. The following technologically informed analysis of the audiovisual construction of the videos reveals how the formal interface asserts the specificities of digital technologies.

The analysis employs a theoretical model generated using aspects of existing scholarship that has engaged the technological specificities of the interface, digital form and aesthetics, and the sonic construction of space. Binkley's theorisation of the interface in 'The Quickening of Galatea: Virtual Creation without Tools or Media' (1990a) and in 'Digital Dilemmas' (1990b), usefully elucidates the technological origins and future cultural impact of its mediation of reality and virtuality. Holtzman's analysis of the formal expression of digital processes in early digital art in *Digital Mosaics: The Aesthetics of Cyberspace* (1998), and Michel Chion's theory of the 'auditory frame' in *Film, a Sound Art* (2009), illuminate the formal construction of virtual space. In *The Language of New Media* (2001a), Manovich's concepts of digital non-space and 'info-aesthetics' further clarify the innovative formal construction of the videos.

Rooted in the live performance of a video-streaming interface and associated digital functions, *zZz | Grip* models the collaboration between virtual and human operations that the interface makes possible in digital culture. The video articulates the interface's typical functionality and associated functions through the on-screen

reciprocity of the human and virtual components of interactivity. Integrating these specificities of the digital arts and online space with the human user, it enacts the technological operation of the interface. *Moonwalk*'s recursion of the informational aspects of the *YouTube* interface formally emphasises the interface's transposition of digital information into a form that the user can understand. This recursion of interface images intercedes the non-space of virtual space that the video models and the space that the user occupies, thereby associating the otherwise heterogeneous realms of the lived world and virtuality. *Noteboek*'s formal appropriation of the *YouTube* interface comprises a number of video clips that consist of performances involving virtual objects and the objects and beings of the lived world. These hybrid performances enable us to perceive the complex technologically enabled association of, and communication between, lived and virtual spaces and objects that the digital interface facilitates.

zZz | Grip refers explicitly to the technologies that underpin the digital arts through the use of props and coloured cards that refer to specific software commands and functions, such as 'A/B dissolve'[169] or 'particle burst',[170] and by the performance of these commands and functions by on-screen performers. In addition, their tightly choreographed performance is designed so that it formally reproduces a video streaming interface on which zZz's music video plays.

The video is as much a formal articulation of the technologies that underpin digital systems and operations, as it is a music video for the song 'Grip'. Whereas the image in conventional music video is typically designed to illustrate the lyrics,

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[169] A/B dissolve is a command in computer based audiovisual editing whereby a dissolve transition intercedes between two shots, in this case, shot A and shot B. For an explanation of the dissolve transition, see the previous chapter.

[170] A particle burst is a visual effect that is typically digitally generated using post-production software, whereby an image assembles or disassembles from a multiplicity of coloured particles.

emotion or atmosphere of the song or piece of music, *zZz | Grip* visually foregrounds the technology that underpins the video, emphasising the function (or malfunction, in the case of the spinning wait cursor) of its facilitating technologies. The video formally integrates the performance of the song with the performance of the digital commands and operations that underpin the video.

In response to early digital culture, Binkley asserted that the 'interface mediates between reality and virtuality, interchanging objects and numbers' (1990a: 237). The dialectic that he establishes between reality and virtuality was, perhaps, appropriate to that period of digital culture. However, it is less relevant to contemporary digital culture, where pervasive virtual technologies now form part of our cultural experience or 'reality', in which we interact with the virtual realm from the lived world through the interface. Binkley seems to pre-empt this, adding that, 'If the computer brings about any dramatic cultural changes, they will come from interactive systems' (*Ibid.*).

zZz | Grip responds to the dramatic cultural change that has been brought about by the interface through its performance of virtual operations by human beings and the objects of the lived world. This performance enacts the interaction that the interface facilitates between the virtual and lived worlds in contemporary digital culture.

The interface that Binkley critically engaged was a purely technological connection between the computer and its peripheral input and output devices – 'a conceptualizer that abstracts numbers from objects and events, presenting them to the computer in a specified digital format' (1990a: 234). Despite dealing strictly with machine communications,[171] he nevertheless identifies the essential liminality of the

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[171] Recall Shannon and Weaver's research into machine communications discussed in Chapter 3.

interface whereby lived world objects are transposed into digital data that can be recognised by digital systems. The subsequent development of interface has made this process of transposition reciprocal, where digital data is transposed into objects and phenomena that can be recognised by human beings. *zZz | Grip* formally articulates these advanced technological specificities of the interface by enacting, through live performance, a reciprocal exchange between the objects, functions and commands of the virtual world with the beings and objects of the lived world.

Moonwalk explicitly appropriates the interface. Kohout copies the video player screen of the *YouTube* interface exactly, including the loading screen that shows that it is preparing to load a video, the progress bar that indicates the duration of the video file being played, the playhead that indicates where in the video's file the currently displayed audiovisual material is, and, the timer that indicates the point within that file that the currently displayed audiovisual material occupies, in relation to the total duration of the video. These aspects of the interface convey information on the progress, duration and current position of the video file being streamed and so relate, through the interface, the digital file that exists virtually, to the *YouTube* platform user in the lived world. Kohout's reiteration of images of content-less interfaces formally emphasises these aspects of the interface, consequently highlighting its role as a means whereby digital information is translated into a comprehensible form.

Kohout's imbrication of *YouTube* interface images produces a visual mise en abyme effect,[172] which reproduces the visual mise en abyme construction that was characteristic of early fractal art. Art produced using fractals – mathematical sets that

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[172] Mise en abyme is a formal technique in Western visual arts in which an image contains a smaller copy of itself, which contains a smaller image of itself, and so on, where the sequence appears to infinitely recur. It has other related implications throughout the arts: in literature – a play within a play, for example, and in film – a dream within a dream, for example.

typically display self-similar patterns – was a distinctly digital art form, whose underlying digital processes were formally articulated through mise en abyme. A feature of Holtzman's aesthetics of cyberspace, he asserted that: 'Fractal worlds are, in effect, computation in visual form' (1998: 52). By repeating a number of similar images of the *YouTube* interface through the depth of the screen, the video formally fuses the informational aspects of the interface with the fundamental mathematical operations of digital data.

Moonwalk's mise en abyme of interface images that recalls the fractal – and so potentially limitless – recursion of image elements takes place within, and so asserts, the similarly potential limitlessness of virtual space. Kohout formally emphasises the potential limitlessness of this space through the recursion of interface images that develops through the indeterminate space of the video's black background. The visual construction of indeterminate space in this way is sonically reinforced by the stark tones of the video's soundtrack that are devoid of an 'auditory frame' (Chion 2009: 470), or a sonic indication of the space in which the sound is produced.

Manovich said: 'There is no space in cyberspace' (2001: 253), referring to the lack of physical or tangible space in the virtual digital realm. Kohout's audiovisual rendering of virtual space as a visually indeterminate and echoless space formalises it as the non-space that Manovich describes. By occurring in the foreground of the video, the recursion of *YouTube* interfaces that intercedes the world that the user occupies and the virtual space beyond, establishes – as the actual *YouTube* interface does – 'a correspondence between two incompatible formats,' enabling their 'heteromorphic mapping, or heteromorphism' (Binkley 1990b: 16-7).

In his video, Kohout formally asserts the technological operation of the interface by formally emphasising those aspects of the interface that relate

information on virtual data to the user in the lived world. In addition, his recursion of interface images emphasises the potential multiplicity and limitlessness of virtual reproduction. The video's emphasis on the informational aspects of the interface and its recursion of these images emphasise the interface's role as the technological threshold between the heteromorphic realms, through which the user, in the lived world, can access and interact with virtual space.

Noteboek formalises how: 'Interfaces form bridges between the real and the virtual and back again' (Binkley 1990b: 18). Involving a number of central and peripheral computing devices (laptop, scanner and printer), the video clips that form part of this video are formally connected through Lohbeck's hand-drawn rendering of the *YouTube* interface. Her video fuses live performance and hand-drawn digital devices and other electronic tools, where the objects and beings of the lived world interact with virtual objects. This on-screen interaction articulates the reciprocal communication between digital and lived world entities through the interface that Binkley identified in the technological specificities of its I/O operation.

The video reinforces the performative assertion, made by each video clip, of the technological operation of the interface, by appropriating the *YouTube* interface as the formal setting for these video clips. As virtual and lived world beings and objects are brought together in the video clips that play on the *YouTube* interface, so too the disciplines of digital drawing, video production and animation are brought together in its formal articulation. Consequently, this video formally refers to the technological operations of the interface and to its fundamental digital data whereby all media forms can now cohere within the virtual space of the digital realm. The formal construction of this video enables us to perceive the multiplicity of media types that are made

available to us in the digital realm and how our access to, and interaction with, this realm is facilitated by the digital interface.

Manovich responded to the burgeoning practices of information access in early digital culture by suggesting that: 'we need something which can be called "info-aesthetics" – a theoretical analysis of the aesthetics of information access as well as the creation of new media objects which "aestheticize" information processing' (2001: 217). Information access has since become a central feature of contemporary digital culture, taking place through digital interfaces of various kinds. Its practice is now so pervasive that it has even engendered its own vocabulary – to Google,[173] for example – a verb used to describe information access that takes place specifically through the *Google* search engine interface.

Noteboek aestheticises information access. We initially witness Lohbeck access the *Google* and *YouTube* interfaces through typed on-screen commands and throughout the video we see the mouse cursor (pointer) of her laptop successively access each of the video clips that play in the video. By combining her performance of information access with the video's formal integration of different media types, and of lived world and virtual objects, *Noteboek* audiovisually models the technological operation, scope and liminality of the interface.

By formally articulating the *YouTube* interface - the range of video clips that have been accessed through that interface; the interrelation in these video clips of objects, beings and spaces of the lived and virtual worlds; and, the performance of processes of communication and interaction between them that each video clip and the video itself presents - *Noteboek* asserts the fundamental technologies and

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[173] The verb, to Google, is defined in the *Oxford English Dictionary* as: 'To use the *Google* search engine to find information on the Internet; To enter (a search term) into the *Google* search engine to find information on the Internet; to search for information about (a person or thing) in this way.' It entered the *OED* in March 2006.

processes of information access that have become central to contemporary digital culture. It enables us to perceive and so, to consider, the complex processes of communication and exchange between the beings and objects of the lived world and the objects and spaces of the virtual realm, which take place through the interface.

5.4   Conceptual implications of the formal interface

Given the pervasiveness of our engagement through the interface throughout digital culture, it takes on technologically specific conceptual significances. As the ingress to the vast digital realm that we engage from the lived world, the interface acts as the liminal space between them, through which the communication between human beings and digital technologies can take place. The conceptual significances of the interface are implicated in its formalisation in *zZz | Grip*, *Moonwalk* and *Noteboek*.

The following analysis of the conceptual implications of the interface in these videos employs a theoretical model that draws on existing scholarship concerning the experiential specificities of interactivity. In 'Digitality: Approximate Aesthetics' (2001), Munster's 'approximate aesthetics' theorises the liminality of the virtual and digital realms in interactivity. Hansen's *New Philosophy for New Media* (2004) was initiated by the enframing function of the body in relation to the potentially limitless data of the virtual realm. His concept of digital art as the process of such enframing illuminates the relevance of the interface in the videos. In 'The Information Bomb: A Conversation' (Armitage 2001), an interview he had in 1999 with Friedrich Kittler,[174] Virilio usefully theorises the experience of interactivity as the integration of the lived and digital realms. In addition, Murray's aesthetics of 'incompossibility' helpfully identifies how these realms affect, but nonetheless remain distinct from, one another in interactivity.

The live action performance of the interface in *zZz | Grip*, in which the actions of human beings are circumscribed by technological operations, formally articulates the necessary cooperation and negotiation between the human and technological counterparts of interactive processes. Its formalisation of the interface is conceptually

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[174] Friedrich Kittler (1943–2011), the renowned media technology scholar and theorist.

rooted in the processes of interactivity. In its formal emphasis on the file information aspects of the *YouTube* interface, *Moonwalk* conceptually emphasises the user experience of media access, and of cultural engagement, through the interface. Its recursion of content-less interface images further emphasises the user experience by focusing on the information about the (non-existent) files, rather than on their audiovisual content. It thereby formally and conceptually asserts the interface that facilitates interactivity. *Noteboek* formally integrates virtual and lived world objects and spaces that interact with each other, while the centrality of the *YouTube* interface in the video provides the conceptual frame within which that on-screen interaction can conceivably occur.

The video-streaming interface that *zZz | Grip* presents is formally complex. It models the reciprocal exchange between the virtual and lived realms through the human performance of virtual objects, spaces, commands and functions that occurs in the tangible space of the school gym.

For example, in the performance of the 'I/O error' the performer lies motionless on the trampoline while another performer enters the screen, twirling the umbrella as a spinning wait cursor. This live performance is consistent with the typical manifestation of an I/O error in a digital system, in which a programme or an entire system ceases to respond to inputs, resulting in a 'hang' or 'freeze' in operations, which is demonstrated by a static screen accompanied by a spinning wait cursor.

The video's formal hybridisation of virtual and tangible objects and spaces explicitly asserts the integration and reciprocity of the human being and the commands and functions of digital technologies in the operation of the interface. The

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interface establishes its operational and functional parameters. This circumscribes the options available to the interacting human user, and so circumscribes the range of actions taken by the user.

For example, a video streaming interface makes a limited number of functions available to the user: the video database search engine, the play/pause function, the screen size option, and so on. These functions that are particular to the video-streaming interface consequently dictate the range of actions a user can take, so that his/her interaction with the system is limited to the individual functions and commands that the interface makes available.

Munster's concept of the approximate aesthetics of digital interactivity illuminates this process. In 'Digitality: Approximate Aesthetics', she discusses a mode of operation particular to digital art whereby it creates 'zones through which the organic and machinic[175] become approximate to each other' (Munster 2001). Her approximate aesthetics, which describes the experience of interactivity as a continual movement between the active body and its perception of digitally mediated art, is facilitated by the digital interface. The interface facilitates their approximativeness, being the liminal space that intercedes the technological and human counterparts of interactivity. Moving beyond the technological parameters whereby interactivity takes place, her aesthetics focuses on the experiences produced by the 'relations of proximity' that interactivity had introduced to millennial digital culture (Munster 2001). The performance in *zZz | Grip* formalises the approximativeness of technology and human user, and the virtual and lived worlds, which Munster found specific to the interface.

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[175] Here, Munster appropriates Gilles Deleuze's term that indicates, in the case of cinema, the autonomous and automatic technological production of images that are made available to the viewer or thinking subject. For him, the machinic production of images in this way corresponds with the machinic nature and production of thought itself. See the bibliography for this chapter: Deleuze (1985); (1989); (2000).

She concludes her essay: 'The digital in both its production by artists and consumption by audiences introduces a universe of reference that is both hypermediated and incorporeal. But current experiences of extended and distributed embodiment, which aesthetic digital experience can offers [sic] us, are also recompositions of materiality through its differential relation to immaterial information' (Munster 2001). Here, Munster describes the complex conditions of interactivity whereby the beings of the lived world are in constant negotiation with spaces and objects that exist only virtually in the digital realm. zZz | Grip's live performance of the interface enables us to perceive the complexity of interactivity that Munster describes by formalising the collaboration between the virtual and lived worlds that the interface facilitates, where the human and virtual components of interactivity are in a continual process of negotiation.

The progress bars and timelines that feature throughout *Moonwalk* are key to the conceptual significance of the interface in this video. When it was originally published online, the formal construction of the progress bars and timelines that appear in it and those of the *YouTube* interface were identical.[176] The progress bar and timeline of the *YouTube* interface in which *Moonwalk* played visually corresponded to the progress bars and timelines of the multiple images of the *YouTube* interface in the video. Through his correlation of the progress bar of the *YouTube* interface and those of the video's *YouTube* interface images, Kohout establishes a formal relation between the lived world and the virtual realm beyond the interface. The video conceptually refers to the interface that intercedes and thus, facilitates their approximative relation.

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[176] 'At the time *Moonwalk* was uploaded the original scroll-bar had been corresponding to the video in whole duration. Since then youtube [sic] added new buttons to the interface and changed the format from 4:3 to 16:9' (Kohout 2008).
Accessed from: http://www.youtube.com/watch?v=0DVN4m41QCE, 28/05/09.

Digital art, Hansen points out, comprehends the human enframing of digital data: 'by placing the embodied viewer-participant into a circuit with information, the installations and environments [digital artists] create function as laboratories for the conversion of information into corporeally apprehensible images' (2004: 11). *Moonwalk* addresses the enframing function of the interacting body by formally linking the virtual space inside the frame of the video, with the lived world outside that frame. Its continuous replication of the progress bars of the *YouTube* interface, through which the user selects, controls and enframes the available digital video data, emphasises the conceptual significance of the interface.

Moonwalk's imbricated recursion of interface images takes place over a black background depicting the limitlessness and amorphousness of digital space. The video's formalisation of content-less video streaming interfaces is accentuated by its repetition of the file-loading wheel that is typically displayed when the desired media content – a video file, for example – has not yet loaded. These combined features of *Moonwalk* that visually reinforce the lack of video content in the *YouTube* interface images, assert the video's formal emphasis on the technologies of the interface, rather than on its content.

Kohout's modelling of virtual space as a void formally articulates Virilio's theorisation of the integration of the lived and virtual realms. He said: '...the new technologies make space disappear into a void, in its extent and in its time. [...] There is also a pollution of the distances and time stretches that hitherto allowed one to live in one place and to have relationships with other people via face-to-face contact, and not through mediation in the form of tele-conferencing or on-line shopping' (Armitage 2001: 102). Echoing Manovich's assertion of the non-space of cyberspace, Virilio uses the term 'void' to differentiate the virtual realm from the

realm in which we live. While his negative tone is key to his theory of the politics of virtual space, his analysis usefully – if obliquely – theorises the interface through which the space and time of digital technologies 'pollute' those of the lived world. Kohout's formalisation of the indistinct and amorphous space of the virtual realm, which is superimposed on by the recursion of interface images, a recursion which intercedes, as the interface does, the viewer in the lived world and the virtual realm beyond.

Noteboek models the constant exchange between the virtual and lived realms that takes place through the interface. By formally nesting hand-drawn animation inside a live action video, inside a hand-drawn *YouTube* interface, for example, Lohbeck's video models the communication between objects, spaces and beings of the lived world and those of the virtual realm that the interface facilitates. She employs different media types to distinguish the objects and spaces of these realms. For instance, the mirror, guitar, scanner/printer and the interface itself are rendered in hand-drawn animation, in order to explicitly formally contrast her body and the other objects and spaces of the lived world, which she renders in live action video footage.

As the video formally reproduces the *YouTube* interface, its narrative operates according to the functional logic of the interface. Functioning as the meeting place of all digitally mediated and digitised media types, the interface facilitates our access to them, and facilitates the exchange of communications and operations between the lived and virtual worlds. Central to this video, Lohbeck's hand-drawn interpretation of *YouTube* provides a space within which her formal fusion of virtual and lived worlds, and the interaction between those worlds, can conceivably occur.

Their interaction through the interface is experientially complex. For example, an action taken by the human being or a function carried out by the digital system

effects subsequent actions or functions, while these counterparts of the interactive process nonetheless remain separate from one another. Murray's aesthetics of 'incompossibility', after Deleuze, [177] is theoretically rooted in this complex relationship between the lived and virtual worlds. Through his concept of incompossibility he theorises interactivity as a process in which, 'these elements fail to converge while still not negating or rendering each other impossible. Rather than either converging or remaining impossible for each other, rather than being either included or excluded, they stand in paradoxical relation to one another as divergent and coexistent: as "incompossible"' (Murray 2000).

His theory illuminates the relationship between virtual and lived world elements in Lohbeck's video. As with processes of interactivity, wherein the spaces and objects of the lived and virtual worlds communicate with and respond to each other, but nonetheless remain distinct, so in this video Lohbeck similarly interacts with her animated virtual objects. For example, her hand, rendered in live action footage, plucks the strings of an animated, virtual guitar. This interaction between a lived world object and a virtual object produces music, while they nonetheless remain formally distinct from each other. As in digital interactivity these interacting objects stand in paradoxical relation to one another because, while they interact, respond to each other and produce a collaborative result, they nonetheless occupy heterogeneous spaces.

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[177] See the bibliography for this chapter, in particular: Deleuze (1969); (1989); (1993); (1994); (1997).

5.5   Interface narrative

By drawing the technological specificities, and the experiential and conceptual implications of the interface and its facilitating technologies into their audiovisual narratives, *zZz | Grip*, *Moonwalk* and *Noteboek* exploit the formal interface in order to produce audiovisual narratives that are discursive of the technocultural relevance of the interface in digital culture. The narrative operation of the interface in these videos is conceptually complex. Because they involve the formal interrelation of the beings, objects and spaces of the lived and virtual worlds, their narratives audiovisually reproduce the operation of the interface.

In order to attend to the conceptual complexity of the narrative operation of the interface in these videos, I employ a theoretical model that incorporates existing scholarship into the aesthetics, psychology and philosophy of interaction. In 'Interface Realisms: The Interface as Aesthetic Form' (2005) Pold argues for the cultural discursiveness of the interface in digital art. Tim Barker's philosophy of the experience of interacting with digital artworks through the digital interface, in 'Objects and interaction' (2011c), places human and non-human objects on the same ontological footing. Nusselder's research in *Interface Fantasy: A Lacanian Cyborg Ontology* (2009) applies the psychological concept of fantasy to interactivity in order to extrapolate the experiential implications of the interface's mediation of the 'virtual' and the 'real', which he engages both as categories of Lacanian psychology *and* as the fundamental binary of digital culture.

zZz | Grip's live performance of the interface communicates the complex integration of technology and human, and of the virtual and lived realms, which defines digital interactivity. The interface enables their integration and communicative exchange, where digital data is enframed or embodied by the user.

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zZz | Grip narrativises the processes of interactivity through a performance in which human performers literally embody digital operations that dictate the parameters of their performance. *Moonwalk*'s narrative articulates the human enframing of digital data that is specific to interactivity by emphasising, through recursion, the aspects of the digital interface that express information on digital data to the user in the lived world. The narrative correlation of these aspects of the interface with an indeterminate presentation of the virtual realm articulates the difference between these realms that is negotiated by the interface, thereby facilitating communication between them. *Noteboek*'s multi-layered narrative articulates the processes of communication that the interface facilitates in contemporary digital culture. Lohbeck's interaction with the animated *YouTube* interface throughout the video explicitly articulates interface operations. The narratives of the four video clips that she selects through the interface likewise model the communication between, and interaction of, objects and beings of the lived and virtual worlds that the interface makes possible.

zZz | Grip's live performance of the interface models the communication between, and collaboration of, human and technology that the interface facilitates in digital culture. It conceptually refers to the approximativeness engendered by the interface, whereby these technological and human aspects interact with each other while nonetheless remaining distinct from one another. The distinction between virtual and lived space, and between the live and the mediatised, is problematised by the interface, whose practical operation facilitates the communication and operational exchange between these heterogeneous components of the interactive process.

zZz | Grip's narrative relates the approximative operation of the interface. It interprets the practical structures of the interface using lived world objects – the trampoline as the screen of the video player and an area of the school gym floor as the timeline bar, for example – and its commands and functions through the trampolinists' and other performers' live performances.

Throughout the narrative human beings adapt their actions according to the parameters set by the technological operations of the interface. For example, the successive performance of digital functions and commands: 'pulse', 'rotate & pulse', 'flip & pulse', 'I/O error', 'blur & pulse', 'particle burst, and 'A/B dissolve', produce a sequence of images on the video player screen that comprise the performer holding a card containing the word describing the type of function or command being performed *and* the performance of that function or command. This sequence, in which those digital operations dictate the actions of the human beings performing them, produces a narrative that articulates the integration of and communication between human beings and digital operations in processes of interactivity.

By integrating the on-screen realisation of the digital function or command with its textual representation in human-readable format,[178] *zZz | Grip*'s narrative continuously formally and performatively integrates the digital and human components of the interactive process. Consequently, it formally and performatively emphasises the interface, the means whereby these components of interactivity become approximate to each other. By reinforcing the logic of the operation of the interface through the live performance of digital functions or commands, which models the human response to virtual operations, the video's narrative relates the engagement of the digital and virtual realms that the interface facilitates.

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[178] Human-readable format is the representation of digital data in a form that can be naturally read by human beings.

Pold's research into the aesthetics of the interface identified how: 'Through reflexive and self-reflexive moments and strategies, digital art foregrounds the interface in ways that traditional software normally does not. Consequently, digital art becomes an important witness to the changes the computer has brought and is still bringing to our societies' (2005: 6). His theory elucidates the complex narrative operation of the interface in this video. The video's performance of the interface also enacts the logic of its operation, in its reciprocity of human actions and digital operations. Rather than facilitating access to the virtual space of the video database (as in its typical software manifestation), *zZz | Grip* appropriates the formal and conceptual significances of the video-streaming interface for narrative purposes. The video's narrative enables us to perceive the collaboration, communication and exchange between the virtual and digital worlds that the interface makes possible in contemporary digital culture.

Foregrounding the interface, *Moonwalk*'s narrative enables us to perceive another important aspect of interactivity. Kohout presents digital space as a black screen, explicitly devoid of content, on which content-less *YouTube* interface images recur through the depth of the screen. The formal presentation of the video emphasises the limitlessness and amorphousness of virtual space that we access through the interface. The video's delimitation of our view of this space and of the extent of the recursion of interfaces, which appears to continue into infinity, produces a narrative that articulates the enframing function of the human user in processes of interactivity, in relation to the limitless and amorphous data of virtual space.

The potential limitlessness of the video's indeterminate presentation of virtual space and of the recursion of interface images, is contrasted by the video's formal articulation of temporality, which is constructed through the cumulative presentation

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of the timelines of each interface image. The potential magnitude of the virtual space and time that *Moonwalk* makes available to us is restricted by the two-minute, twenty-second duration of the video, which is formally expressed by the timeline of the progress bar of the first interface image. The durations indicated by the timelines of subsequent interface images are progressively shorter, so that when the video plays the cumulative movement of their timeline playheads traces a straight line across the screen. This formal construction of playheads draws attention to the temporality of the video whose duration limits our view of its articulation of virtual space and of its recursion of interface images.

By emphasising the informational aspects of the *YouTube* interface, rather than the content that such an interface would typically present, Kohout's video produces an audiovisual narrative that articulates the individual experience of sitting in front of the computer screen in the lived world, and accessing the objects of the virtual world – such as this video – through the interface. By drawing our attention to this experience, the narrative of this video formally relates these heteromorphic spaces, thereby relating the experiential specificities of our interaction with the digital arts through the interface.

Tim Barker describes how interaction:

> [...] involves a common operation between human and non-human processes. As such, our experience of the world is conditioned not solely by our own internal impulses and drives, but by a process of prehension across contemporary actual entities, as the sensory processes by which we come to know the world take place on the planes that are in contact with digital technologies. (2011c: 76)

Moonwalk's modelling of digital space as an amorphous void, coupled with its fractal recursion of content-less interface images, asserts the specifically digital nature of the realm that we perceive, engage with and respond to in interactivity. Rather than

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playing any media content, the video emphasises the functional aspects of the *YouTube* interface images, which delimit their function, and correspondingly, the type of activities that our engagement through such interfaces comprises. The video's narrative thus relates how – as Barker points out – digital technology influences the experiences of engagement that take place through the interface.

In *Noteboek* Lohbeck's formal integration of a number of media types and of the lived and virtual realms takes place within the *YouTube* interface, which is itself mediated in this video through digitally mediated hand-drawing. Her hand-drawn virtualisations of objects of the lived world share screen space with other objects of the lived world – and with Lohbeck herself – that are rendered in live action footage. Throughout the video we observe the co-existence of objects of the lived world and virtual objects within the space of the video and within the space of its constituent video clips, and we observe Lohbeck interacting with these virtual hand-drawn and lived world objects.

The functional logic of the interface that Lohbeck's narrative employs expresses how (as *zZz | Grip* and *Moonwalk* have also demonstrated) the distinction between human and virtual processes, and between virtual and lived spaces and objects, is eliminated by the interface. As such, the interface represents in technological form - being at the centre of user experience (UX)[179] - the bleeding of the virtual into the reality of the lived world that Slouka found characteristic of 1990s digital culture. This central and distinguishing feature of digital culture - and one upon which so much of digital scholarship has turned[180] - was introduced by the very virtuality of mediation by 1s and 0s (binary data), but became central to the operation of digital culture by the invention and adoption of the digital interface. The interface

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[179] The concept 'user experience (UX)' comprises the practical, experiential, meaningful and affective features of human–computer interaction.
[180] See the literature review for this thesis: Chapter 1: Digital Media Arts Scholarship Reframed.

is the primary site where the melding of virtuality and reality takes place. Indeed, the striking contribution that it makes to the cultural experience centres on this innovation of digital technology.

Turkle found such a distinctly digital cultural experience fruitful for her on-going project of research on psychoanalysis and human-technology interaction. Similarly, considering the cultural fallout of the digital revolution, Turkle argued that technology 'catalyzes changes not only in what we do but in how we think. It changes people's awareness of themselves, of one another, of their relationship with the world' (1984: 18-19). Analysing the implications of this in the early movements of the digital revolution, she identifies the changing cultural-political ramifications of our relationship with what had simply been tools with which we worked, where they had started to become part of our social and psychological lives. She examines how the eradication of the distinction between humans and computers, which primarily took place at the interface, had significant implications for human identity (1995). Rooted in the digital cultural dilemma of how we can define and differentiate real life from simulated life, *Noteboek*'s narrative is discursive of this central problem of digital life that was presciently identified by Turkle in her research.

Noteboek formalises and simultaneously narrativises the interface. For example, in the third video clip of the video – 'Spiegelbeeld' – Lohbeck opens her notebook on a page that has a mirror drawn on it. Immediately we can see her 'reflection' that has been animated and composited within the space of the mirror's frame. As she moves her head and thrusts her eye towards the notebook page, in the lived world, we can see the immediate response of her actions in the virtual mirror, which shows their reflection. In this way the narrative articulates the exchange

between the virtual and lived worlds as it occurs in interactivity, where these heterogeneous realms can interact with and influence each other.

The video's narrative sequences four video clips according to Lohbeck's selection of them through the *YouTube* interface. As with the example of the guitar and mirror video clips, the final two video clips also depict the interaction between the lived and virtual worlds, in which virtual objects immediately respond to actions that she makes in the lived world. Lohbeck's formal emphasis on the interface illuminates the complexity of the video's innovative narrative. By exploiting the conceptual implications of the interface that derive from its liminal role in digital culture, the video's narrative asserts the interface's facilitation of interaction between the objects of the lived and virtual worlds.

Later echoing Murray's theory of digital incompossiblity, Nusselder asserts that:

> Media technologies have a peculiar relation to the real as the impossible. On the one hand they virtualize – via the screen (of fantasy) – our subordination to our immediate, real environment. On the other hand they try to restore – on the screen – a sort of virtual immediacy: think, for example, of real-time telecommunications. These technologies seem to be guided by the ideal of eliminating our immersion in the "natural" environment ("natural presence") and restoring an immersion in a virtual environment ("virtual presence"). (2009: 29)

The interface, the technological means whereby this physical (and psychological) negotiation between the lived and virtual realms takes place, focuses the user's attention on the virtual realm while he/she nonetheless physically occupies the lived world. *Noteboek*'s narrative relates the complex interrelation of the virtual and the lived realms that Nusselder finds fundamental to processes of interactivity.

For example, Lohbeck uses the *YouTube* interface loaded on her virtual 'laptop' to access the four video clips, thereby articulating how her physical body, in

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the lived world, is focused on the objects and processes that she engages with, which are contained within the virtual world of *YouTube*. Compounding the negotiation between the lived and virtual worlds that her performance articulates, the video clips that she accesses through the *YouTube* interface, comprise her performances with virtual (animated) objects that individually and reflexively articulate the negotiation between the lived and virtual worlds that interactivity involves. Those performances assert the approximativeness (Munster 2001) and incompossibility (Murray 2000) of the two worlds, whereby – as Nusselder also points out – our immersion in the lived world is never fully eliminated by our immersion in the virtual environment, and vice versa. In order to formally contend with the necessary virtuality of all of the elements of the video's narrative, Lohbeck articulates the heterogeneity of the lived and virtual worlds by formally contrasting live action footage of lived world objects with her hand-drawn animation of virtual objects.

Conclusion

The formalisation of the interface in *zZz | Grip*, *Moonwalk* and *Noteboek* audiovisually models the reciprocal relationship between human and technology, the connection of the lived world to the virtual realm, and the interaction between them, which are facilitated by the interface. Sharing screen space with the other content of these videos, the formal interface produces audiovisual narratives that are discursive of the increasing interrelation of the virtual and lived realms, and of the human being and digital technologies, in contemporary digital culture.

By formally interrelating lived world experiences and digital technologies, these videos produce innovative means of articulating the contemporary cultural condition, in which digital technologies that are designed to be immediate, or in other words, to recede into the background of our digitally mediated experiences, nonetheless exert a demonstrable influence on those experiences. Pold noted that, had the drive towards total digital immediacy been successful, then 'digital technologies would probably not have any paradigmatic effect on culture and aesthetics since they would not make a marked difference' (2005: 6). These videos articulate a number of ways in which the interface continues to have an effect on contemporary cultural experiences.

According to diverse formal strategies, *zZz | Grip*, *Moonwalk* and *Noteboek* model the interface through performance, digital effects and animation. By exploiting the advanced capacity of digital media technologies for the on-screen composition of diverse elements produced through these various means, these videos articulate the operational logic of the digital interface. Through the live performance of the interface, *zZz | Grip* formally articulates the reciprocal exchange between the objects, functions and commands of the virtual world and the beings and objects of the lived

world, which is made possible by the interface. *Moonwalk*'s formal emphasis on the informational aspects of the *YouTube* interface and its recursion of content-less images of this interface emphasises its role as the technological threshold between heteromorphic realms, according to which the user, in the lived world, can access and interact with virtual space. *Noteboek*'s innovative hybrid composition of animation and live action footage enables us to perceive and so, to consider, the complex processes of communication and exchange between the beings and objects of the lived world and the objects and spaces of the virtual realm, which take place through the interface.

zZz | Grip's formal and performative hybridisation of virtual and tangible objects and spaces explicitly asserts the integration and reciprocity of the human being and the commands and functions of digital technologies in the operation of the interface and by extension, in the operation of digital culture. The interface establishes its operational and functional parameters, thus circumscribing the options available to the interacting human user. The performance in this video enacts the approximativeness of the digital and human components of interactivity, in which digital operations circumscribe the range of actions that can be performed by the user, while these components nevertheless remain distinct from one another. *Moonwalk* models the virtual realm as an indistinct and amorphous black space over which Kohout superimposes the recursion of *YouTube* interface images. As it intercedes the viewer in the lived world, and the virtual realm beyond, the video's formal recursion of interface images conceptually reproduces the function of the software manifestation of the *YouTube* interface[181] in digital culture. *Noteboek*'s innovative formal hybridisation of virtual and lived world objects facilitates the on-screen

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[181] www.youtube.com.

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performance of interaction between the lived and virtual realms. Their on-screen interaction conceptually asserts the incompossiblity of these components of interactivity, in which they interact, respond to each other, and produce a collaborative result, but nonetheless remain distinct from one another. The centrality of the interface in the paradoxical relation of the virtual and lived worlds is key to its conceptual significance in contemporary culture.

Through the live performance of the interface and its associated digital functions or commands, which models the human response to virtual operations, *zZz | Grip*'s narrative relates a continual integration of, and communication between, digital technology and the human user in processes of interactivity. Formally emphasising the interface – the means whereby these components of interactivity become approximate to each other – the performance enacts the operational logic of the interface. The video's narrative thus relates the communication and exchange between the digital and virtual realms that is facilitated by the interface, through a performance of the interface that simultaneously enacts the communication and exchange between these realms. Rather than playing any media content, *Moonwalk* emphasises the functional aspects of the *YouTube* interface images, which delimit their function, and correspondingly, the type of activities that the human engaging through such interfaces can carry out. The video's narrative relates how digital technology exerts influence on the processes of interactivity and thus, on the experiences of engagement, which take place through the interface. *Noteboek*'s narrative relates the complex operational, physical and psychological interrelation of the virtual and the lived realms that are fundamental to processes of interactivity. The narrative, in which the virtual objects in the video are formally distinguished from the lived world objects that it also features, models the constant interaction and exchange

between these heteromorphic elements in interactivity. It enacts the operation of the interface through Lohbeck's engagement with virtual space through the *Google* and *YouTube* interfaces and also within each of the four video clips shown in the video.

The way in which these videos foreground the technologies of the digital arts and online space through their formalisation of the interface, and consequently draw the conceptual implications derived from its technocultural operation into their narratives, enables us to perceive and consider the impact of the interface in contemporary digital culture. The centrality of digital technologies to the formal, conceptual and narrative significances of the interface in these videos asserts the digital specificity of this form of audiovisuality, which, instead of re-presenting the pre-digital conventions of audiovisual narrative, produces its own technoculturally specific audiovisual narratives.

By comprehensively asserting the technological, formal and conceptual specificities of the interface in their narratives, these videos articulate the autonomy of the digital audiovisual medium in terms of how we access and engage online video through the digital interface. Despite the logical path I have traced in this chapter, in which I argue for the specificities of the interface that develop from its inherent qualities as a technological entity, which underpin its technological operation, whose audiovisual formalisation introduces culturally defined conceptual implications of that operation to the video, which, in its interrelation with the other content of the video, produces narratives that relate aspects of contemporary digital culture, these implications of the interface in online video are contingent on one another.

Chapter 6:   Database

...if cultural production through digital media reflects a serious engagement with society,
then consideration of remix aesthetics [...] will be integral to any critical discourse.

Jamie O'Neil
'The Remix Aesthetic: Originality Mixed and Mashed-up' (2006)

Digital databases are fundamental to digital culture, collectively serving as an archive

of all of the files that we have access to through the Internet, and all of the files that

underpin the search engine and media streaming interfaces through which we access

those files. A specifically digital entity, the database was identified by Manovich as

one of the key lexical units of the language of new media. He described the space of

the Web as: 'a collection of numerous files, hyperlinked but without any overall

perspective to unite them' (Manovich 2001a: 257). Digital remix has emerged as a

narrative response to the abundance of media that the database makes available to

contemporary culture, uniting heterogeneous media elements in a single media text,

according to various discursive perspectives.

The term 'remix' has typically referred to the recombination of pre-existing

musical elements, samples, or tracks into a new piece of music, by analogue or digital

means (Gunkel 2008). Since the advent of digital technology, whereby all mediated

phenomena and different types of media can be subsumed to homogeneous data, there

has been a notable increase in remix practices in the contemporary digital arts. This is

also due to digital technology's democratisation of the tools of their production and of

our unprecedented access to our shared cultural heritage that exists, available for

streaming, on the databases that underpin the Internet. Accordingly, the term remix

now describes an expanded field of media arts practices that recombine pre-existing

sonic, visual and audiovisual samples (small excerpts of a pre-existing work) into a

new digital artwork.

The remix has emerged as a key feature of online video, in the digitally specific audiovisual practice of video mashup. A mashup video recombines samples from pre-existing sonic, visual and audiovisual digital media in the production of a new video. Mashups typically fall into one of three categories: vids (fan videos created by remixing a number of samples from commercial media sources, typically film and television),[182] YouTube Poop (videos made by remixing samples from pre-existing public domain, expired copyright, or fair use media sources with lo-fi or jarring post-production effects),[183] and the supercut (a fast-paced remix montage of short video samples that focuses on a single element from its sources, typically a word, phrase, or cliché from film or television).[184]

Resisting those established mashup categories, the recent online videos *Please Say Something* (2009) by David O'Reilly, *Wu Tang Clan Mixtape* (2010) by Eclectic Method and *My Favorite Color* (2011) by Kutiman[185] demonstrate innovative nuances of the online video remix. In contrast to those fan-driven video remix practices that focus on narratives, thematics and icons that derive from pre-existing media types and diegeses, the remix videos selected for analysis formally, conceptually and narratively articulate the technocultural specificities of the digital database. These videos were selected for analysis because while they each comprise distinct formal strategies according to which the database is audiovisually realised through the remix, they cohere in terms of their narrative articulation of aspects of the technocultural role of the database in contemporary digital culture.

Heterogeneous media elements and types cohere within the remix narrative. The remix is the narrative response to the ever-growing abundance of diverse media

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[182] See Jesse Walker (2008).
[183] See http://youchew.net.
[184] See http://supercut.org.
[185] These videos are available to view at: http://digitalaudiovisuality.com/database/

elements and types that the database makes available to contemporary digital culture. In the epigraph to this chapter, O'Neil identifies the conterminous increase in remix practices with the rising cultural significance and prevalence of the database. He consequently argues that a critical analysis of the remix should be central to critical discourse on the digital culture within which it has flourished. I concur with his analysis of the critical significance of the remix, and I engage the videos analysed in this chapter from a similarly technocultural perspective. To his concept of the critical significance of the remix, I would add the similar significance of the glitch, the loop and the interface in the critical analysis of contemporary digital arts practices and culture.

In this chapter I critically analyse the formal, conceptual and narrative implications of the database in the selected remix videos, in order to establish the technocultural significance of the database in contemporary digital culture that they evince. Following a methodology of close textual analysis, I establish how their remixes formally assert the inherent and technological specificities of the database, thereby introducing its conceptual implications to the audiovisual narrative and interrelating them with the content of those videos. Their interrelation in this way produces narratives that are specific to conditions and experiences of contemporary digital culture. The analysis of the videos employs a theoretical model that combines aspects of established digital arts scholarship on the inherent, technological, conceptual, experiential and cultural specificities of the database.

Section 6.1, 'Creative context of the videos selected for analysis', establishes the context of the videos analysed, in terms of trends within the bodies of work of the artists responsible.

Section 6.2, 'Remix formalisations of the database', addresses the formal construction of each of the videos from the perspective of the inherent specificity of the database – outlined by Manovich in the first paragraph of this chapter – as a collection of diverse media types and elements, which paradoxically cohere within its space.

The analysis undertaken in section 6.3, 'Remix and technology', benefits from Manovich's research in which he identified the technological specificity of the database (2001a) and its significance in remix practices (2005). Henry Jenkins helpfully illuminates the role of the digital database in the convergence of diverse media (2008), making them available to digital arts and cultural practices. Eduardo Navas's analyses of the remix as Internet search (2012b) and as aesthetic form (2012c), usefully accounts for the technological roots of the practice of remix. Together, these aspects of their research illuminate the technological specificity of the database as it is formally articulated in the videos.

In section 6.4, 'Conceptual implications of the remix', the analysis is informed by Manovich's theorisation of the symbolic significance of the database in the nascent digital culture of the turn of the century (2001a). Hansen's concept of enframing illuminates the relationship between the human user and the potentially limitless archive of the database (2004). O'Neil's subsequent research in 'The Remix Aesthetic' (2006) and in 'Mix/Remix as Epistemology: The Implications of the Metamedium, Digital Media' (2007), usefully establishes a reciprocal relationship between technology and human in digital culture, in which our engagement with the digital network both facilitates and influences our pursuit of knowledge.

In section 6.5, 'Remix narrative', Manovich's theoretical contrast of narrative and database (2001a), O'Neil's analysis of remix discourse (2006), Navas's

theorisation of the technological and narrative specificity of the regenerative remix (2010a) and Tim Barker's analysis of the multi-temporalities of the database (2012), combine to inform my analysis of the videos' remix narratives.

Rather than being selected for analysis simply because their methods of remix formalise the database, *Please Say Something*, *Wu Tang Clan Mixtape* and *My Favorite Color* are key to the current discussion because they demonstrate the conceptual complexity that the remix introduces to online video, and whose organisation of the content of these videos produces innovative audiovisual narratives that are rooted in the conceptual implications of the digital database in contemporary culture. These implications of the remix derive from experiences of engagement with various digital databases throughout digital culture, which likewise informs the narrative significance of the remix in these videos. Despite their differing formal approaches to remix, the videos are nonetheless related through their formal articulation of the inherent, technological and conceptual specificities of the database and through their narrative articulation of its contemporary cultural significance.

While remix has been explored through a wide range of creative arts practices - from visual arts and music, to film and video - and through analogue and digital technologies, what is key to the discussion underway is the digital specificity of the remix practices in the videos. To give a brief example - analogue films such as *What's Up Tiger Lily* (Woody Allen, 1966) or *The Atomic Cafe* (Pierce Rafferty, Jayne Loader, Kevin Rafferty, 1982) also incorporate found and archival footage. Re-cutting a Japanese spy film, *International Secret Police: Key of Keys* (Senkichi Taniguchi, 1965), and archival footage on nuclear war, respectively, to produce original audiovisual narratives these films necessarily implicate concepts relating to the media archive and associated discussions of the concept of originality within a

media arts practice marked by the re-use of pre-existing footage. What the videos under discussion reveal is the digital specificity of their practice of the remix of the content of the database, not merely in terms of how it is done (as these general practices of appropriation feature throughout analogue and digital remix), but in terms of the broader technocultural context that has inspired and influences this particular, contemporary and digital practice of online video.

Of course, the most fundamental difference that the database has made to remix practices is the way in which it facilitates such practices by making their raw material - archive footage - vastly more readily available to the artist than analogue archives did, being - in stark contrast to the digital database - physically and geographically bound to the lived world. Digital data makes this possible, because once a media text is either digitally produced or digitised, it can be made accessible to the wider population through the digital network. However, it is not merely because the database makes it easier to do this kind of work that I make the claim that the formal innovations of the videos under discussion are specific to digital technology. Rather it is because of the experiential and socio-cultural specificities of the database in digital culture, which are implicated in digital remix practices, that the remix videos under discussion can be considered formal, conceptual and narrative articulations of a specifically digital medium.

Fundamentally, it is the way in which our shared cultural heritage is no longer hierarchically (alphabetically, chronologically, and so on) organised, as it would be in an analogue archive, and the unprecedented level of abundance of the media texts that are now available to us through the database, that have conceptual implications that are drawn into the digital remix. The implications of our experience of interacting with the database for concepts of our shared cultural heritage, history and memory,

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and for abundance and selection, are essential to the discursiveness of the remix in the videos discussed throughout this chapter.

Visually juxtaposing and nesting samples taken from historically and qualitatively diverse media sources, *Wu Tang Clan Mixtape*'s remix imposes narrative order on the achronological and non-hierarchical archive of digital files that comprises the database. These samples paradoxically sonically cohere within Eclectic Method's audiovisual remix, while their heterogeneity is visually emphasised, formally modelling the diversity of media that cohere within the space of the database. By relating historically and qualitatively diverse aspects of the history of the band, the video conceptually implicates the database – the extensive source of its constituent samples – as our shared digital memory of the mediated history of the career of the band. Its remix of samples, taken from the various periods throughout that history, produces a narrative that proves the validity of the band's early claims to musical and business prowess. Because it explicitly interrelates multi-temporalities within the band's history, the database necessarily forms part of this video's narrative.

My Favorite Color variously repeats and rearranges samples taken from *YouTube* video clips and incorporates hyperlinks to these clips in the *YouTube* database. This remix produces Kutiman's audiovisual composition, while it also formally articulates the non-hierarchical, randomly accessible file structure of the database. By embedding links to the video clips from which he selected the samples used, the remix conceptually asserts Kutiman's enframing of the abundance of files that exist on the *YouTube* database. The video comprises a dual-faceted remix, where the visual and sonic aspects of the remix differ in terms of their emphases on the samples involved. This conceptually implicates the variable remixability that is specific to the database in the video's narrative. This regenerative video mashup

remixes a number of samples of individual musical performances to produce an original musical narrative and facilitates access to these samples on the *YouTube* database. The narrative of this video results from these combined specificities of the database that are foregrounded in the remix.

Please Say Something's formal response to the remix emphasises the diversity of its media influences, thereby articulating the convergence of the media that has been facilitated by the digital database. Eschewing the smooth visual rendering enabled by digital technologies, O'Reilly's emphasis on the diversity of media influences that cohere within his rendering of digital three-dimensional space formally articulates the diversity of media that similarly cohere within the digital database. The video's remix-style coexistence of diverse media influences on screen conceptually asserts the parity of media types and elements, as they exist in the non-hierarchical database. This, in turn, conceptually asserts O'Reilly's exposure to the database, which is evidenced in his formal interpretation of the remix. *Please Say Something*'s narrative asserts the universality of the database's archive of media in order to articulate the universality of its subject matter. Establishing a contrast between the pre-existing media that have influenced the remix and the reinterpretation of these media in the video, O'Reilly emphasises the gravity of the subject matter of the video's narrative.

6.1   Creative context of the videos selected for analysis

In *Wu Tang Clan Mixtape* (2010), the UK audiovisualists[186] Eclectic Method (Jonny Wilson, Geoff Gamlen and Ian Edgar)[187] audiovisually reinterpret the mixtape - the thematic compilation of songs traditionally produced using analogue audiotape, but now involving analogue, or digital audio formats.   Resulting from their live performances, in which they digitally remix sonic, visual and audiovisual material to produce music-driven audiovisual compositions, their online video practice similarly centres on the audiovisual remix.[188] *Wu Tang Clan Mixtape* is indicative of a period in Eclectic Method's video practice in which they explored the formal and narrative potential of the audiovisual mixtape in *The Tarantino Mixtape* (2009), *Convergence Mixtape* (2010), *8-Bit Mixtape* (2010), and later in *The Lady Gaga Mixtape* (2011) and *Almodóvar Mixtape* (2012).

Kutiman (Ophir Kutiel) is an Israeli musician, composer and artist, whose interdisciplinary digital audiovisual practice combines these skills.[189] *My Favorite Color* (2011) is indicative of this practice, in which he remixes a wide range of samples taken from non-professionally produced *YouTube* videos in order to produce music-driven audiovisual compositions. He produced *My Favorite Color* following the success of his 2009 online audiovisual composition album entitled *ThruYOU*, which received over 10 million views in the first two weeks of its launch online, and critical acclaim.[190] In subsequent videos such as *Kutiman Mixes Maroon 5* (2010), *Thru Jerusalem* (2011) and *Thru Krakow* (2012) he continued to remix images according to musical structure, but instead of sourcing non-professionally produced

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[186] For a detailed definition of the term audiovisualist, see Lloyd Barrett and Andrew R. Brown (2009).
[187] Ian Edgar left the group in 2011 and Geoff Gamlen left the group in 2012.
[188] Eclectic Method's work is available to view at: www.vimeo.com/eclecticmethod.
[189] Kutiman's work is available to view at: www.youtube.com/user/kutiman.
[190] See *Time Magazine* (2009), 'The 50 Best Inventions of 2009',
http://content.time.com/time/specials/packages/article/0,28804,1934027_1934003_1933973,00.html.

videos online, he used either professionally produced footage or footage that he shot himself.

Irish-born David O'Reilly's ground-breaking independent animation practice is practically, formally and conceptually rooted in digital technologies.[191] *Please Say Something* (2009) received considerable international institutional recognition, winning a variety of awards and commendations on the arts, animation and film festival circuits.[192] Marked by its formal hybridity, this animation remixes a number of media styles, tropes, artefacts and genres, rather than a number of individual audiovisual samples – as is the case in the other two videos under analysis in this chapter. *Please Say Something* forms part of a trend in O'Reilly's work, which includes *RGBXYZ* (2007), *Octocat Adventures* (2008) and the critically acclaimed *The External World* (2010). In these videos he deconstructs three-dimensional digital modelling, eschewing the smooth rendering offered by such systems in order to produce, with the addition of jarring transitions and glitches, paradoxically discordant image elements. The remix-style formal construction of *Please Say Something* emphasises, rather than eliminates, the heterogeneity of its constituent elements.

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[191] David O'Reilly's work is available to view at: http://www.davidoreilly.com.

[192] Golden Bear Best Short Film - *Berlinale* (2009); Grand Prize - *Kurzfilmtage Winterthur* (2009) Special Jury Commendation - *Encounters* (2009); Special Mention - *Animated Dreams Tallinn* (2009); Silver Dove - *DOK Leipzig* (2009); Deutscher Kurzfilmpreis (2009); Best Narrative Film - *Ottawa* (2009); First Prize for Best Short Film - *Animadrid* (2009); Winner - *Cartoon D'Or* (2009); High Risk Award - *Fantoche* (2009); Special Distinction - *Annecy* (2009); Best Film - *Oberhausen* (2009); Special Mention - *Prix Ars Electronica*.

6.2   Remix formalisations of the database

Wu Tang Clan Mixtape, My Favorite Color and *Please Say Something* each demonstrates an individual nuance whereby the digital remix formally articulates the inherent specificities of the database, as described by Manovich – above. As he noted, the database encompasses an unprecedented diversity of media types and elements. This makes them available to the digital remix, which unites a variety of media according to various narrative perspectives. The remix construction of these videos formally asserts the heterogeneity of their constituent video elements, thereby formally articulating the inherent specificity of the database in their remix strategies.

Fig. 6.1 *Wu Tang Clan Mixtape* (2010) by Eclectic Method

The wide range of qualitatively and historically diverse samples that populate the remix in *Wu Tang Clan Mixtape* visually asserts their heterogeneity through juxtaposition and nesting, while the sonic elements of these samples nonetheless cohere within Eclectic Method's audiovisual remix of a number of the Wu Tang Clan's hip-hop tracks. In its paradoxical coherence of distinctly diverse media samples in this way, this remix video asserts the heterogeneity of media types and elements that nonetheless cohere within the space of the database.

Fig. 6.2 *My Favorite Color* (2011)

In *My Favorite Color* a number of samples taken from *YouTube* videos of individual musical performances are remixed into an original audiovisual composition. While the sonic aspects of the samples remixed in this composition unify into a coherent piece of music, their visual elements assert their heterogeneity by maintaining their difference through sequential replacement or juxtaposition. The video's formal assertion of the specificities of the database is further emphasised in the final shot where all of the samples used coexist on screen, as they similarly coexist in the *YouTube* database.
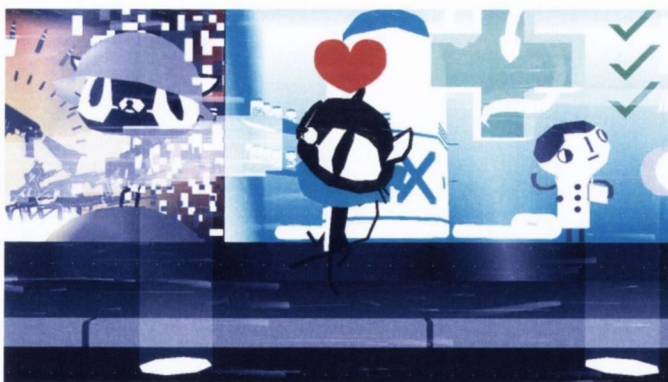

Fig. 6.3 *Please Say Something* (2009) by David O'Reilly

Demonstrating a formal style of audiovisuality that has developed from the remix, *Please Say Something* adopts the heterogeneity of media elements that is characteristic of the remix in the production of an entirely original audiovisual narrative. The video's formal emphasis on the diversity of its influences that derive

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from a wide range of media articulates the unprecedented diversity of media types and elements that the database makes available to contemporary digital culture and cultural practice.

Wu Tang Clan Mixtape comprises five audiovisual compositions that are arranged according to the compilation logic of the mixtape, forming a remix medley of a number of the Wu Tang Clan's hit tracks. Within this overarching structure, Eclectic Method's remix of audiovisual samples produces an audiovisual remix of the Wu Tang Clan's hit tracks, which also documents the career and success of the band. Rather than simply correlating visually to the sonic elements of the hip-hop tracks that they audiovisually remix, Eclectic Method selected the samples that feature in this video for their relevance to the band's career.

Within the video's audiovisually interpreted hip-hop structure, Eclectic Method remix a variety of samples that have memorialised key aspects of the Wu Tang Clan's career. They span, for example, the band's very early days in hip-hop, their subsequent professional success, the death of band member Ol' Dirty Bastard (Russell Tyrone Jones) in 2004, their music videos, live shows and interviews throughout this period and their more recent appearances in film. Eclectic Method remix samples of poorly shot, low quality footage of the band rapping on the streets of their hometown – Staten Island (Shaolin) – with samples of awards ceremony footage from later in their career when the band had earned critical, popular and commercial success. With these samples they also remix samples from the Hong Kong Kung Fu movies from which the Wu Tang Clan derived their brand and identities, and samples from music video and live performance footage that illustrate the breadth of their creativity and musical output over the course of their career.

Throughout the video, the sonic aspects of these samples coherently combine – as is typical of musical remix – to produce a sequence of remixed hip-hop tracks. By contrast, the visual aspects of these samples are marked by their incongruity, explicitly deriving from a number of periods in, and types of, media. For example, early low quality home movies of the band are nested within and juxtaposed on screen with samples of slick commercial music video productions, television interviews, film and live performances, so that their incongruity is emphasised throughout the video. The video's remix of qualitatively and historically diverse samples visually emphasises their heterogeneity, while paradoxically, these samples simultaneously sonically cohere within the audiovisual composition.

My Favorite Color demonstrates another musically driven form of audiovisual remix. While the remix in *Wu Tang Clan Mixtape* audiovisually interprets the structure of hip-hop composition by following the predetermined style of the Wu Tang Clan's oeuvre, in *My Favorite Color* Kutiman remixes samples from non-professionally produced musical performance videos in order to produce an original audiovisual composition. Kutiman sourced all of these samples from video clips of individual musical performances on the *YouTube* database, whose sonic elements he remixed according to the musical structure of his composition. He sequences or juxtaposes the visual elements of these samples in order to visually reflect his construction of their sonic elements in the composition.

The video remixes a number of audiovisual samples of individual musical performances involving single instruments. The consistent single camera angle shooting style of each of these samples – which is typical of non-professional *YouTube* video production – presents nonetheless formally distinct musical

performances in terms of their shot size, composition and mise-en-scène.[193] The explicit heterogeneity of these samples in terms of their various individual musical subjects, formal presentation and the people involved, emphasises the heterogeneity of the media files from which the samples are derived. This formally models the heterogeneity of media files that are stored on the digital database and have been likewise made available to the video's production.

The centrality of the database to this remix is further emphasised at the end of the video. As it finishes, the number of samples occupying the screen diminishes until only the sample of the organ being played, with which the video began, can be seen and heard. Kutiman repeats this organ sample a number of times while the screen cuts to black and then gradually, the visual elements of all of the samples that he used return to coexist on screen, juxtaposed in a type of interactive collage. In this way, this final shot of the video formally models the database as the collection of files that underpins this remix. Kutiman emphasises the necessary database counterpart to his remix by including an interactive capability within this shot whereby any image in the collage can be clicked to select the sample's originating *YouTube* video.

The formal hybridity of *Please Say Something* draws influence from the remix by incorporating a diverse range of media styles, tropes, artefacts and genres. O'Reilly assembles a variety of styles of cartoon characters within a three-dimensional game space, in which both traditional and contemporary animation styles coexist with digital rendering artefacts that include pixellation and glitch. He juxtaposes this range of animation styles and digital artefacts with various references to cinema: through his use of the filmic sci-fi trope of the opening title sequence appearing over an image of outer space; the reference that he makes to the rewind

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[193] Mise-en-scène is a term derived from theatre practice, which refers to the setting of all of the stage elements. It endures in audiovisuality where it denotes the setting of all of the on-screen elements.

scene from the *Funny Games* (1997; 2007) films by Michael Haneke; his use of subtitling; and the rolling credits that appear at the end. Among these features he also incorporates references to television programming, from the TV test card that appears regularly throughout the animation, to his use of domestic, office and institutional settings for his story, and his serialisation of the narrative, all of which are typical of television drama and sitcom. He uses this combination of media styles, tropes, artefacts and genres as the setting for his narrative, in which he reverses the traditional power roles of the archetypal cartoon characters – the cat and mouse – in order to tell a story about domestic violence.

Rather than remixing pre-existing audiovisual samples that were sourced using the digital database, as is the case in the other two videos, *Please Say Something* demonstrates an extension of the remix where it becomes a formal style of audiovisuality that similarly emphasises the heterogeneity of its constituent elements. Rather than imposing narrative structure on diverse elements that were sourced from the database, this video formalises the diversity of media that digital data and the database makes available to contemporary digital culture by combining influences from a number of styles, tropes, artefacts and genres that derive from a wide range of media types. By emphasising the heterogeneous provenance of the influences that O'Reilly transposed to his animation, rather than by eliminating their formal diversity, *Please Say Something*'s remix narrative articulates the diversity of media that the database comprises.

6.3   Remix and technology

In addition to formally asserting the inherent specificities of the database, the formal strategies employed in these videos assert the technological specificities of the database, as a randomly accessible, achronological and non-hierarchical archive of an abundance of digital media files. The following technologically informed analysis of the audiovisual construction of the videos elucidates how their remixes formally relate to the database technologies that underpin the digital arts and online space.

It exploits existing scholarship that has engaged the technological implications of the database in its narrative counterpart, the remix. Manovich's research in *The Language of New Media* (2001a) identified the technological specificity of the database and its pervasiveness in digital culture. In a later self-published essay, 'Remixing and Remixability' (2005), he developed a useful theory of the technocultural significance of the database in remix practices. Jenkins' *Convergence Culture: Where Old and New Media Collide* (2008) usefully illuminates the significance of the digital database in cultural heritage and practice, in terms of the diversity of media that the database comprehends and makes available to vernacular culture. Navas's research into the remix as Internet search in 'Modular Complexity and Remix: The Collapse of Time and Space into Search' (2012b) and as aesthetic form in 'The New Aesthetic and The Framework of Culture' (2012c) usefully theorises the relationship between the technology and practice of the remix.

Despite their differing formal approaches to remix, *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something* are nonetheless related through their formal articulation of the technological specificities of the database. *Wu Tang Clan Mixtape*'s remix imposes narrative order on the achronological and non-hierarchical archive of digital files that comprises the database. Visually juxtaposing and nesting

samples taken from historically and qualitatively diverse media sources, the video formally reinterprets the achronology of the database. *My Favorite Color* explicitly references the *YouTube* database in its exclusive use of samples taken from *YouTube* video clips and in its incorporation of hyperlinks to that database. This remix, in which samples are variously repeated and rearranged to produce Kutiman's audiovisual composition, formally articulates the non-hierarchical, randomly accessible archive of files in the *YouTube* database. *Please Say Something* formally responds to remix by emphasising the diversity of its media influences, thereby formally articulating the convergence of the media that has been facilitated by the digital database. O'Reilly's rejection of the smooth visual rendering for which digital technologies tend to be used, emphasises the diversity of media influences that cohere within his rendering of digital three-dimensional space, and formally articulates the diversity of media that similarly cohere within the digital database.

In *Wu Tang Clan Mixtape* Eclectic Method remix diverse samples taken from the audiovisually mediated history of the Wu Tang Clan. This imposes a formal structure, inspired by the band's music, on the database's otherwise unordered and non-hierarchical store of these video files. Exploiting the fundamental homogeneity of the data that underpins digital technologies, whereby sound and image are at root series of ones and zeros,[194] Eclectic Method composite a variety of audiovisual samples on screen according to a formal style that appropriates the Wu Tang Clan's sonic style of hip-hop composition.

In their hip-hop compositions Wu Tang Clan mixed a number of audio tracks and samples so that a number of sounds coexisted simultaneously within the music at

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[194] See the Appendix to this thesis.

any one time, producing the characteristic densely textured sound of their music. For example, this would typically involve the mixing of a drum machine beat with a bass riff, with a sample from a pre-existing song, with a sample from a Kung Fu movie, with an a cappella rap, and so on. Substituting audiovisual samples for the sonic samples that are typically used in hip-hop composition, Eclectic Method's remix constructs *Wu Tang Clan Mixtape* according to the audiovisually reinterpreted musical structures of the hip-hop mix.

Access to these constituent samples of the remix in *Wu Tang Clan Mixtape* is facilitated by the digital database. Moreover, Eclectic Method's remix of samples that visually and sonically correlates historically and qualitatively diverse media sources – combining samples of home video with those taken from music video and film and television footage – formally articulates the technological specificities of the database. Manovich identified how: 'As a cultural form, the database represents the world as a list of items, and it refuses to order this list' (2001: 225). By formally juxtaposing a wide range of media sources that relate to the history of the career and varied projects of the band, the video achronologically presents this history through samples that similarly achronologically exist in the database.

Later, Manovich deemed remixability 'a built-in feature of digital networked media universe,'[195] recognising the practice of remix in all aspects of engagement with the network, whereby our particular journeys through the network via hyperlinks and search engines produce remixes of the content of the database accessed through those journeys. Rooted in the remixability afforded by the digital database, *Wu Tang Clan Mixtape* formally articulates the agency of the database by emphasising the heterogeneity of its remixed samples. Its achronological sequencing of those samples

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[195] Lev Manovich (2005), 'Remixing and Remixability'.
http://imlportfolio.usc.edu/ctcs505/ManovichRemixModular.pdf accessed 09/03/10.

recalls the experience of remixability that characterises our cultural engagement with the digital database through interactivity.

In *My Favorite Color* Kutiman exclusively uses samples from video clips that he accessed on *YouTube*, combining a number of these samples to produce his digital orchestration. His formal juxtaposition of these samples allows formally disparate elements to occupy the screen at the same time, thereby emphasising their heterogeneity while they combine to (somewhat paradoxically) produce a coherent piece of audiovisual music. The paradoxically coherent relation of disparate elements in this remix formally articulates the broader technological significance of the database in our engagement with the digital arts and online space. While the database is the unordered, non-hierarchical archive of the files of digital culture, our engagement with the database imposes a certain narrative (sequential) order on these files, in terms of our successive selection of them in interactivity with the digital network, or in terms of their textual arrangement in remix narratives.

Navas noted how: 'The type of production at play in networked culture was not possible prior to the rise of software, as it is the speed of information exchange that makes such production feasible' (2010a: 173). Discussing the impact of the digital in arts and cultural practice, Navas identifies the technological specificity of the digital remix, which is facilitated both by the speed of the network and by our access to its databases of information and media files. Overtly structured in relation to the *YouTube* database, Kutiman's engagement with this technology enabled him to produce his audiovisual composition. The relationship of *My Favorite Color*'s remix to the database is explicitly articulated in the final collage shot of the video through which we can access the samples' originating videos in the *YouTube* database.

The database search engine is an essential aspect of Kutiman's remix practice in *My Favorite Color*, as it is of Eclectic Method's remix practice in *Wu Tang Clan Mixtape*. Using the search engine – such as that built into the *YouTube* interface – to access its database of video files, Kutiman selected samples of performances that he required for his digital orchestration. Echoing Manovich's earlier theorisation of the database, Navas notes how the Internet search 'repositions all forms of production on an ahistorical layer when search engines provide people with access to material' (2012b: 2). Rather than being sequentially or chronologically arranged, the files in the *YouTube* database are classified using descriptive metadata,[196] thereby facilitating their selection based on their content. This enables digital remixers such as Kutiman and Eclectic Method to access the raw material of their remixes which they then structure through remix narrative, thereby imposing order on these otherwise unordered digital files that exist on the database.

Motivated by the formal heterogeneity of the remix, *Please Say Something* combines influences from a variety of media styles, tropes, artefacts and genres. By emphasising the heterogeneous origins of these influences, O'Reilly's formal strategy articulates the diversity of media that the database makes available to contemporary digital culture.

Absorbing influences from a number of media, ranging from the historical to the contemporary audiovisual arts, *Please Say Something* formally articulates the abundance of digital texts, objects and artworks that comprises the database. The video's remix style thus formally responds to the convergence of media that has been engendered by digital technology, in particular, the digital database. Jenkins defines convergence as the:

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[196] Information that classifies the data content of a digital file.

[…] technological, industrial, cultural, and social changes in the ways media circulates within our culture. […] the flow of content across multiple media platforms […] and the migratory behavior of media audiences who would go almost anywhere in search of the kind of entertainment experiences they want. Perhaps more broadly, media convergence refers to a situation in which multiple media systems coexist, and where media content flows fluidly across them. (Jenkins 2008: 282)

In his definition Jenkins indirectly theorises the database as the site of the convergence of digitised and digitally produced media, which facilitates the flow of media content by enabling audience access to a variety of media using database search engines. *Please Say Something*'s remix formally responds to the media convergence that is fundamental to digital culture, by converging influences from a wide range of historical and contemporary media within the video's narrative. O'Reilly remixes these media influences within the video's deconstructed, characteristically digital, three-dimensional rendering of space. This overtly digital space models the virtual domain that facilitates media convergence. Heterogeneous media converge, or virtually cohere, within the digital database. *Please Say Something* responds to the convergence of digital culture that has been facilitated by the database by appropriating the formal construction of the remix narrative as a style of audiovisuality.

6.4   Conceptual implications of the remix

Given the pervasiveness of our engagement with the database throughout digital culture, it takes on conceptual significances that are specific to its technological function.   As the ever-expanding store of the texts, objects and other forms of information that we engage throughout digital culture, the database represents an unprecedented abundance of cultural texts and experiences that comprise contemporary culture.   The database acts as the repository of our shared cultural heritage – a fact that becomes increasingly relevant with the rise of social media such as *Facebook* or *Twitter*, whereby we archive photographic, video and textual recordings of our personal lives, or *Pinterest*, whereby we archive evidence of our personal taste.   We increasingly outsource our memories and personal data to these databases and use search engines to retrieve them.   These conceptual significances of the database are implicated in the individual formal remix strategies of *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something*.

The following analysis of the conceptual implications of the database in these remix videos employs a theoretical model that draws on scholarly examinations of database, which considered the relationship between its technology and the cultural experiences that centre on its operation.   This model exploits aspects of Manovich, Hansen and O'Neil's research concerning the experiential and conceptual implications of the database in recent and contemporary digital culture.   In his seminal work, Manovich usefully theorised the symbolic significance of the database in the nascent digital culture of the turn of the century (2001a).   In *New Philosophy for New Media* (2004), Hansen beneficially theorised the enframing of digital data performed by the human user in relation to the potentially limitless archive of cultural texts, objects and artworks that exist, virtually, on the database.   O'Neil's subsequent

research in 'The Remix Aesthetic' (2006) and in 'Mix/Remix as Epistemology: The Implications of the Metamedium, Digital Media' (2007), usefully established a reciprocal relationship between technology and human in digital culture in which our engagement with the digital network both facilitates and influences our pursuit of knowledge.

Wu Tang Clan Mixtape's remix asserts the historical breadth of media stored in the database through its interrelation of samples taken from various media types and periods, spanning early 1990s home video to recent commercial film. The conceptual significance of the database in this video – the extensive source of its constituent samples – is as the repository of our shared cultural heritage, through which the remix traces a random access journey.[197] The remix in *My Favorite Color* conceptually asserts the enframing function of the human user in the face of the abundance of cultural files that comprise the digital database. By embedding links to the video clips from which he selected the samples used, Kutiman enables us to experience his individual enframing of the abundance of files on the *YouTube* database, from which he composed his video remix. In *Please Say Something* O'Reilly's explicitly digital three-dimensional rendering of space in which he remixes diverse media influences, conceptually models the space of the digital database within which all digitally produced and digitised historical media can coexist. Their coexistence on screen conceptually asserts the parity of media, as they exist in the non-hierarchical archive of the database. It also asserts how O'Reilly's exposure to the databases of our shared digital culture has engendered both his seemingly paradoxical concept of coherence and his innovative formal interpretation of the database remix.

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[197] Random access, as opposed to sequential access, is a term in computer science that describes the ability to access an item of data at any given coordinates in a population of addressable elements.

The remix in *Wu Tang Clan Mixtape* articulates, through its juxtaposition and nesting of historically and qualitatively diverse samples taken from heterogeneous media sources, the historical scope and variety of media that coexist within the digital database. The video's remix of these samples emphasises their heterogeneity. Manovich recognised how, at the turn of the century, the database occupied 'a significant, if not the largest, territory of the new media landscape,' and thus, became a 'new metaphor that we use to conceptualize individual and collective cultural memory, a collection of documents or objects, and other phenomena and experiences' (2001: 228; 214). Visually correlating various aspects of the mediated history of the career of the Wu Tang Clan, *Wu Tang Clan Mixtape* remixes elements of our shared cultural heritage, or memory, of the band, as it exists, virtually, on the database.

For example, the video opens with the namecheck (the introduction to band members), which is typical of hip-hop. Its initial 11-second duration rapid remix of audiovisual samples introduces the leader of the band and primary producer of their music, the RZA. For this remix, Eclectic Method isolate the verbal phrase 'the RZA' from a number of media sources. A sample of backstage footage of the RZA preparing for his on-stage introduction is superimposed by a sample of Forest Whitaker introducing him at the *Vh1 Hip Hop Honors* awards ceremony in 2006. The latter sample is nested within the former so that both are simultaneously audible and visible on-screen. This is followed by a sequence of similarly nested samples of the RZA's appearances in music videos, which are remixed with a sample from the Kung Fu movie *The Abbot of Shaolin* (1979) in which the name of the RZA's alter ego 'the Abbot' is enunciated. Thus this remix implicates the conceptual significance of the database – the abundant source of the band's mediated history – within its narrative.

By imposing narrative on elements taken from the archive of our shared cultural memory of the band's career, this remix video articulates the role of the database as the repository of our shared cultural memory. As already noted in chapter 1, Manovich suggested, following Erwin Panofsky's analysis of linear perspective as a 'symbolic form' of the modern period, that: 'we may even call database a new symbolic form of the computer age [...], a new way to structure our experience of ourselves and of the world' (2001: 219). Manovich's statement is even more relevant to the present time, in which so much of our personal data is now stored on social network databases. Applying this concept of the database to *Wu Tang Clan Mixtape* we can appreciate how the database – the archive of our shared cultural memory – necessarily underpins, and so forms part of, this remix of the mediated history of the band.

My Favorite Color remixes a selection of samples taken from the abundance of amateur recordings of musical performances archived in the *YouTube* database. Kutiman made his selection, or enframed this abundance of files, based on their suitability for his digital orchestration in this piece of audiovisual music. Kutiman's remix conceptually articulates the act of enframing the constant flow of digital information that Hansen identified as a fundamental and specific aspect of digital culture. Kutiman's remix, which results from his engagement with the digital network, 'can be said to 'give body' to digital data – to transform something that is unframed, disembodied, and formless into concrete embodied information intrinsically imbued with (human) meaning' (Hansen 2004: 13).

Hansen's theoretical integration of the concept of human meaning with the enframing function of the body has dual significance for the conceptual implications of the database in *My Favorite Color*'s remix. Kutiman interacted with the *YouTube*

database in order to source the samples for his composition. His search of the database necessarily involved the descriptive metadata whereby the content of digital files is translated into descriptive terms that have meaning for both the human user and the digital system that the user engages.[198] Kutiman's remix of samples taken from the selected video clips into an audiovisual composition enables us to appreciate how such diverse samples nevertheless combine to satisfy the distinctly human understanding of musical harmony.

His inclusion of hyperlinks to the *YouTube* database in the final collage shot further reinforces the conceptual significance of the database in the video. These hyperlinks formally and operationally position the user as the 'center of indetermination' through which he/she can access 'the aggregate of images that comprises the universe as a whole' (Hansen 2004: 4). Henri Bergson's concept of the body as the 'center of indetermination' proposed the body as an individual filter through which images are distilled from the universal flux. Hansen's useful application of Bergson's theory to digital engagement accounts for the individual perspective of the body that selects media elements from the database for the remix. By providing hyperlinks to the files from which he selected the samples used in the video, Kutiman's remix allows us to engage the database through his pre-determined filter of selection, or his enframing.

Please Say Something's remix of various media styles, forms, artefacts and tropes formally traces a history of audiovisuality: from its beginnings in theatre, alluded to when the cat and mouse characters bow to raucous applause at the end of the video; through its development in film, alluded to through the use of rolling end credits, subtitles, the reference to the *Funny Games* films and the generic sci-fi movie

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[198] Recall the similar reflexive relevance of the icons of the GUI, discussed in the previous chapter.

trope of the image of outer space; through television, alluded to by the test card and the settings and storylines of television drama and sitcom; to its evolution in the present day in interactive digital narrative, which is alluded to when the mouse rewinds the story in order to go back in time to alter the arc of the narrative. Throughout the video these styles, forms, artefacts and tropes are interrelated within a three-dimensional rendering of space. This explicitly digital space, within which influences from historical and contemporary media can coexist, conceptually refers to the technological space within which such diverse media coexist – that of the database.

Their coexistence in the space of the video conceptually asserts Navas's theory of the Internet search, which, he argued, places all cultural production archived in the database on an 'ahistorical layer' (2012b: 2). The wide historical scope and varied types of the media influences that coalesce in *Please Say Something*, are overtly modelled throughout the video. As those various media influences coexist in the non-hierarchical database that underpins the Internet, so the formal construction of O'Reilly's remix conceptually refers to this technological specificity of the database. The video's remix allows us to perceive the inherent parity between historical and contemporary media and between different media types when subsumed to digital data. This concept of non-hierarchical media derives from our digital cultural experiences of engagement with the database.

Rather than producing a formal discordance, however, the formal hybridity of *Please Say Something*'s remix can be considered harmonious from the perspective of the conceptual significance of our cultural interaction with the database. While it overtly emphasises the diversity of its media influences, these influences cohere within the video's three-dimensional rendering of space. Indeed, O'Reilly identifies coherence as key to his animation practice: 'what makes these worlds believable is

simply how coherent they are; how all the elements tie together under a set of rules which govern them consistently'.[199] His paradoxical assertion of the coherence of this overtly hybrid formal remix can, however, be deemed rational when considered from the perspective of the inherent and technological specificities of the database in digital culture. While O'Reilly neglects to define or expand upon the set of rules to which he refers in his statement, the inherent and technological specificities of the database provide a conceptual frame within which this overtly hybrid remix style can be considered coherent.

O'Neil's research into the epistemology and aesthetics of the remix has identified the conceptual implications of the database in terms of how our engagement with it influences how we think, and vice versa. As already noted in chapter 1, O'Neil argues that 'the hardware and software of digital home studios enabled remix production to proliferate alongside technological advances, but with this came an important shift in thinking' (2006: 19). O'Reilly articulates this shift in thinking in his statement where his engagement with the network and his encounter with the database enables him to perceive the formal hybridity of his video as coherent. O'Neil later asserts that 'the process of mixing is analogous to thinking,' according to which he argues that digital technology 'facilitates our pursuit of knowledge' (2007: 2). In *Please Say Something* we can perceive how O'Reilly's engagement with the databases of digital culture has influenced his thought processes and correspondingly, has engendered his video's innovative remix style of audiovisuality.

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[199] David O'Reilly (2009), 'Basic Animation Aesthetics':
http://davidoreilly.com/post/17341367227/basic-animation-aesthetics, accessed 13/05/2010.

<u>6.5</u>   <u>Remix narrative</u>

The remix narratives *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something* include the inherent and technological specificities and the conceptual implications of the database. Accordingly, these narratives are discursive of the technocultural relevance of the database in contemporary digital culture. In 2001, Manovich contrasted the database – for him, one of the dominant forms of the late twentieth century – from narrative – for him, the dominant form of the preceding cultural period. Considering that nascent period of the digital media arts, he argued that 'new media designers and artists still have to learn [–] how to merge database and narrative into a new form' (Manovich 2001a: 243). Realised a decade after his research, these remix videos exploit the multi-temporal ahistoricism of the database, its role as the archive of our shared cultural heritage, its variable remixability, its regenerative potential, its universality, and the discursive relationship that it facilitates between original media and their remix reinterpretation. In this way, the videos narrativise the database as a means to articulate the specificities of contemporary digital culture.

In order to attend to the conceptual complexity of the remix narratives of these videos, I employ a theoretical model that incorporates existing scholarship into the relationship between database and narrative, the discursiveness of the remix, its manifestation in digital video and its articulation of the ahistoricism of the database. Manovich's early theoretical contrast of narrative and database in *The Language of New Media* (2001a) – in whose integration he saw the future of digital expression – provides an historical perspective from which to appreciate the contemporary development of the remix narrative in these videos. O'Neil's 'The Remix Aesthetic: Originality Mixed and Mashed-up' (2006) usefully theorises the discourse of the

remix in its re-interpretation and re-contextualisation of pre-existing media. In 'Regressive and Reflexive Mashups in Sampling Culture' (2010a), Navas's theorisation of the functional difference between these two modes of mashup illuminates the technological and narrative specificity of the regenerative remix. In *Time and the Digital: Connecting Technology, Aesthetics, and a Process Philosophy of Time* (2012), Tim Barker's analysis of the multi-temporalities that non-hierarchically comprise the database and its penetration of contemporary culture, usefully theorises the technocultural specificity of the database as it is articulated in the video remix narratives analysed in this section.

In its interrelation of samples taken from the various periods in the mediated history of the career of the band, *Wu Tang Clan Mixtape* produces a narrative that validates the band's audacious claims to musical and professional superiority made in their early career. In the process of relating this story, the video also asserts the multi-temporalities of the band's mediated history that comprise the database's repository of our shared cultural memory of their career. Underpinning this narrative re-presentation of diverse periods in that history, the database also forms part of this video's narrative. The dual-faceted remix in *My Favorite Color*, in which the combined visual and sonic remixes of samples differ in their emphases on those samples, draws the variable remixability that is specific to the database into its narrative. This regenerative mashup remixes samples, developing them beyond their initial significance as individual performances, combining them to produce an original musical narrative, while also facilitating access to these samples on the *YouTube* database. *Please Say Something*'s remix of diverse media influences exploits the universality of the database's archive of media in order to articulate the universality of its narrative. Its remix of influences from pre-existing media establishes a discursive

tension between original and reinterpreted media influences in the video's narrative, whereby O'Reilly emphasises the gravity of the story that his video relates.

The remix construction of *Wu Tang Clan Mixtape* establishes a narrative relation between the early declarations that the band made in their debut album and their subsequent career success. Eclectic Method's remix formally interrelates historically and qualitatively different samples, producing a narrative link between the early creative impetus and professional objectives of the band with evidence of their later achievement of those objectives in various creative arenas.

As I have argued, the database is technologically and conceptually implicated in the video's narrative. A number of samples taken from throughout the band's career share screen space at any one time, articulating the abundance and diversity of the band's mediated history that exists on the database. Accordingly, this video's remix narrative articulates the creative impetus of the Wu Tang Clan's music and of their brand, their subsequent career and financial success, while it also articulates the experiential specificity of the database as the repository of our shared cultural heritage, or memory.

For example, the second part of this audiovisual composition is based in the remix of three tracks from their debut album. Each of these tracks is key to the Wu Tang Clan brand, in which they declare their unrivalled hip-hop skills, their financial motivation and professional approach to the business of hip-hop and the origins of their identity in the film-mediated mythologies of Kung Fu culture. This audiovisual composition begins with a rapid remix of ten individual samples featuring the phrase 'Wu Tang' taken from a number of the English-dubbed Kung Fu movies that inspired the band, whose accompanying visual elements are juxtaposed and nested on-screen.

Superimposed over the end of this sequence is a sample of the RZA's declaration of war (in the style of those Kung Fu movies) on the music industry, which is followed by a number of samples taken from live performances, music videos and interviews in which the other members of the band make similar declarations through their lyrics or personal statements.

Against the audacious claims to superior musical skills, business acumen and professional drive that the Wu Tang Clan made in their music, Eclectic Method remix samples that memorialise the significant creative output of the band in a number of live performances, music videos, television interviews with members of the band and with their fans, and the *Wu Tang Clan* logo, the trademark of their combined music, clothing and accessories brand. These samples that illustrate a range of aspects of, and junctures in, their career, proves those early claims to have been well founded. By formally interrelating these samples, they establish a narrative relation between samples of their initial musical and lyrical audacity with samples from a variety of mediated confirmations of their subsequent success.

Tim Barker's research into the temporal and philosophical implications of digital interaction describes the database as: 'a complex of multi-temporal occasions, a multitude of various temporal events all enfolded in the archive' that 'nests within it various levels of the past' (2012: 15). This theory of the database illuminates the narrative significance of the database in *Wu Tang Clan Mixtape*'s remix. Accordingly, we can appreciate how its non-chronological formal interrelation of samples taken from various periods in the history of the band emphasises the multi-temporality of this remix narrative. Incorporating a variety of periods throughout this history, the video narrativises the multi-temporalities or multiple histories that comprise our shared cultural heritage, which is stored in the database. Thus, we can appreciate

through this remix narrative how, 'tools such as databases and recording technologies are used to make the past present again, to re-present the past' (Barker 2012: 13). In its re-presentation of different levels of the past, *Wu Tang Clan Mixtape* narrativises the database as it also documents the career and professional success of the band.

The construction of the narrative of *My Favorite Color* comprises the variable remixability of the database that Manovich described. The video begins with a single sample of a woman being introduced; the woman then starts to play the organ. As Kutiman repeats the performance element of the sample, he overlays it with another audiovisual sample of a woman introducing the song that she then starts to sing. The visual element of this vocal sample fills the screen so that it replaces the visual element of the organ rhythm sample, thereby visually reflecting the way in which the sonic element of that sample is de-emphasised in the composition. As more samples are introduced to the remix, their visual elements dominate the screen until they are replaced by that of another one, and so on. Soon after this narrative replacement of one sample with another, Kutiman splits the space of the screen into increasing divisions, whereby the visual aspects of a number of samples coexist on screen. The disjunction of the visual and sonic elements of each of the samples in this way produces a dual-faceted remix. Consisting of a visual and a sonic element, each of which differ in their emphases on each of the samples involved, these dual elements of the remix nonetheless coexist in the formation of this audiovisual composition.

Kutiman's constant variation and repetition of the samples remixed produces the changing texture of this composition, while it also narrativises the random access availability of these samples in the *YouTube* database.

The narrative of this video is musically driven. Navas distinguishes regressive mashup, which is 'common in music and is often used to promote two or more

previously released songs', from reflexive (regenerative) mashup, which 'uses samples from two or more elements to access specific information more efficiently, thereby taking them beyond their initial possibilities' (2010a: 157; 158). Whereas his 'regressive mashup' refers to musically driven remixes – and I would argue, is equally applicable to vid, YouTube Poop and supercut remixes, which thematically or formally refer to a pre-existing narrative or diegesis – his theory of 'regenerative mashup' is revealing of *My Favorite Color*'s remix narrative. While Navas discusses the regenerative mashup in terms of Web 2.0 applications, rather than in terms of the digital media arts, this video's remix of samples develops those samples beyond their initial significance as individual musical performances, and combines them to produce an original composition.

The inclusion of hyperlinks to the samples' originating videos in the final collage shot of the video further connects this remix narrative to Navas's theory of regenerative mashup. These hyperlinks facilitate our easy access to the specific samples of the remix, developing the final collage shot into an interactive interface. This shot formally replicates the coexistence, in the *YouTube* database, of the samples that comprise the video, while it simultaneously facilitates our access to them in that database.

Please Say Something remixes a variety of media influences that formally articulate the abundance of media types and elements that the database makes available to digital culture. Incorporating influences from diverse media styles, tropes, artefacts and genres within its narrative, this video links the universality (in terms, of course, of those with access to the digital network) of our shared digital culture that has been made available by the database, with the universality of the video's harrowing story.

Made up of ten narrative episodes that take place in a house, an office and other locations that are typical of the setting of television dramas and soap operas, the story of the domestic life of two crudely digitally animated cartoon characters – the cat and mouse that are typical of traditional celluloid animation – plays out within these spaces. By reinterpreting traditional cat and a mouse cartoons through remix, O'Reilly's narrative subverts the lightweight tone that is typical of such cartoons in order to tell a grave story.

Please Say Something tells the tale of a life-long abusive relationship, detailing the aggressor's constant manipulation of his victim. Consistent with his remix reinterpretation of media influences throughout the video is O'Reilly's reversal of the typical roles of the cat and mouse in traditional animation, whereby the mouse is the aggressor in the relationship. Punctuating this narrative of their violent and overwrought domestic life with digital glitches and pixellation, O'Reilly uses these indications of the transgression of optimal technological operations to formally echo the mouse's actions that similarly transgress optimal – or in other words, harmonious – domestic relations.

O'Neil's theory of the remixer illuminates O'Reilly's remix narrative: 'The Remixer does not consider "media" as merely a recorder of "meaning", but rather as an interface into which we continually re-interpret, re-record, and re-invent meaning' (2006: 23). Taking a number of media influences, O'Reilly re-interprets them in the formation of a narrative in which their diversity nonetheless coheres from the conceptual perspective of the database in contemporary culture. O'Neil identifies how the remix: 'contains, inherently, a form of critical dialogue with the "original" or overarching context' (2006: 22). This concept of the remix has dual significance in this video's narrative. The gravity of the video's narrative of domestic violence is

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emphasised by the critical dialogue that the video establishes with the influences that it takes from traditional animation, amongst other media.

For example, by subverting the typical roles of the cat and mouse in traditional animation and the characteristically lightweight tone of benign violence that is typical of such cartoons, O'Reilly's appropriation of these familiar tropes of animation accentuates the violence and hostility that permeates the video's narrative. The narrative relies on our familiarity with the provenance of the video's influences in traditional cartoons in order to emphasise the gravity of its subject matter. Thus, it depends on our memory of pre-existing animation styles and of their conventions, which has been archived in the digital repository of our memory that is the database. The database thereby forms an essential counterpart to this video's narrative. Its store of media enables the critical dialogue between original media and their appropriation in the video's formal style, which is fundamental to the video's narrative.

Throughout *Please Say Something* O'Reilly's remix style incorporates a number of coexisting diverse media influences, thereby establishing a critical dialogue between the originating media of such influences and their stylistic appropriation in this video. In turn, the video implicates the database both as the source of its narrative influences and as the cultural element in terms of whose specificities we perceive the paradoxical narrative coherence of the diversity of its elements.

<u>Conclusion</u>

Tim Barker identifies the technocultural significance of the database thus: 'The way we understand a database extends over the way we understand and organize information, both in a technological and a social sense, and further, the way we understand our experience of the world' (2012: 177). The online videos analysed in this chapter illustrate Barker's theory by formally, conceptually and narratively articulating the cultural significance of the technological specificities of the database.

Wu Tang Clan Mixtape, *My Favorite Color* and *Please Say Something* exploit the achronological, non-hierarchical and random accessibility of media files that the database makes available to contemporary digital culture. These remixes model the ever-growing abundance of media files that comprises the database through remixes that formally interrelate samples and influences derived from diverse media sources, producing coherent documentary, musical and dramatic narratives, respectively. While these videos visually emphasise the heterogeneity of the media samples and influences that constitute their narratives, they nonetheless simultaneously assert their paradoxical coherence. They do this through remixes that interrelate heterogeneous samples that are historically and qualitatively diverse, samples taken from a number of individual musical performances, or influences that derive from a number of media sources, respectively, to produce original narratives within which these diverse elements cohere. These video remixes – which impose order on the database's abundant archive of digital files – formally model the diversity of media that cohere within the space of the database.

Underpinning digital culture, the database serves as the abundant repository and convergence of diverse media types and elements that represents our shared cultural heritage, or memory. This is asserted in *Wu Tang Clan Mixtape*'s remix of

samples documenting various periods throughout the mediated history of the career of the band, exploiting their historical and qualitative heterogeneity in order to compare the early lyrically and musically expressed confidence of the band and their later career success. In *My Favorite Color* Kutiman takes advantage of the diversity and abundance of files on the database in order to source the individual musical elements that he orchestrates to produce his audiovisual composition. *Please Say Something*'s formal response to the remix, which emphasises the diversity of its media influences, articulates the convergence of the media that has been facilitated by the digital database and is fundamental to contemporary digital culture.

The essential technological specificity of the database is its multi-temporal, achronological, non-hierarchical and randomly accessible archive of digital files, through which we gain an unprecedented access to our shared cultural heritage. *Wu Tang Clan Mixtape*'s remix formally interrelates multi-temporalities in the Wu Tang Clan's mediated history in order to document and compare various periods in the band's career. This formally and conceptually implicates the multi-temporality, which is specific to the database, in the video's narrative. *My Favorite Color*'s remix and repetition of a number of samples taken from *YouTube* video clips produces Kutiman's audiovisual composition, while it also formally and conceptually articulates the non-hierarchical, random accessibility of video files that is facilitated by the database. The video's dual-faceted remix, in which the visual and sonic aspects of the remix differ in their emphases on the samples involved, further asserts the variable remixability of the content of the database. The coexistence of diverse and heterogeneous media influences in *Please Say Something* formally and conceptually asserts the parity of media as they exist (virtually) in the non-hierarchical database.

The formal and conceptual implications of the database form part of the videos' narratives. *Wu Tang Clan Mixtape*'s interrelation of a variety of periods in the band's career tells a narrative of their professional success. Its remix selection of a number of files of the mediated history of the band that are archived in the database mirrors our cultural experience of the database as the abundant source of our shared cultural heritage. *My Favorite Color*'s narrative of diversity and selection is compounded by its embedded hyperlinks to the remix's originating video clips, which also conceptually implicates Kutiman's enframing of the abundance of files that comprise the *YouTube* database. *Please Say Something*'s narrative asserts the universality of the database's archive of media in order to articulate the universality of its subject matter. It also conceptually asserts O'Reilly's cultural exposure to the database, which is evidenced by his formal interpretation of the remix. His narrative hinges on the discursive tension that he establishes between the pre-existing media that influenced the remix and their reinterpretation in the video, thereby asserting the specificities of the database in the video's narrative.

As the analysis of videos undertaken in this chapter has shown, the technological, formal, conceptual and narrative specificities of the database cannot be approached or understood as isolated elements of the video text. Rather, their various significances in the videos examined reveal themselves as contingent on one another. For example, our encounter with the technological specificities of the database reveals those specificities to us, as our engagement with them simultaneously reveals their formal specificities, which, given the digital cultural context of our encounter with these technological and formal specificities, produces a number of conceptual connotations that derive from our lived experiences of engagement with the database. While the technological, formal, conceptual and narrative implications of the database

in the remix videos studied are interdependent and defined in relation to one another, I have attempted in this chapter to trace a logical path through their definition and analysis. The necessary and inextricable interrelation of the implications of the database in these online videos reveals one aspect of the digital audiovisual medium which itself comprises the interrelation of the technological, formal, conceptual and narrative implications of the glitch, the loop, the interface and the database, as they are articulated in contemporary online video.

Chapter 7:   The Digital Audiovisual Medium

New digital media are not external agents that come to disrupt an unsuspecting culture. They emerge from within cultural contexts, and they refashion other media, which are embedded in the same or similar contexts.

<div align="right">

Jay David Bolter and Richard Grusin
Remediation: Understanding New Media (1999)

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The digital audiovisual medium is articulated by the infiltration of the formal, conceptual and narrative specificities of digital technology in audiovisuality. From Bolter and Grusin's perspective, it is a new digital medium that has emerged from the technology and culture of the Internet and has refashioned audiovisuality through digital technologies, in response to the technocultural specificities of digital culture. As we have seen, an abundance of audiovisual media practices coexist in the virtual realm. Digital audiovisuality distinguishes itself from other online audiovisual practices through its formal, conceptual and narrative articulation of the specificities of its facilitating technology, and thus asserts the autonomy of the digital audiovisual medium.

In chapter 1, Lovink identified how the digital art of 2005 lacked an institutional structure, a common language, critical content and decent aesthetics. Having studied online video practices since that period, the current project identifies a digital audiovisual practice that has emerged from the institution of the Internet. It shares a common language[200] – formal glitch, loop, interface and database – on which its critical content, which relates the conditions of contemporary digital culture, and its aesthetics – specifically digital, rather than appropriated pre-digital forms of expression – are based. He criticised contemporaneous digital artists for hanging out in the digital networks and not being confronted with the world. By contrast, the contemporary cultural period – digital culture – is marked by the interrelation of the

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[200] Lovink's concept of the language of digital media correlates to that of Manovich in his seminal work (2001), where the language of a medium comprises the fundamental formal features of a practice, or practices, that are specific to its mediating technology.

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digital networks with the lived world and is expressed, as we have seen, through digital audiovisuality.

In the same chapter, Wands noted the prevalence of outdated critical perspectives that were still being relied upon in the study of the digital arts in 2006. While those perspectives may have been appropriate for research into the kind of digital arts practices that Lovink found in existence at the time, the current project of research has developed a methodology of medium analysis appropriate to the subject of research. Its comprehensive digital specificity has necessitated a technologically centred methodology of analysis that comprehends the technocultural specificities of digital technology in contemporary culture.

The discussion in the preceding chapters has engaged the technological, formal, conceptual and narrative specificities of digital technology in the videos selected, in constant reference to their essential audiovisuality – image and sound, the frame and the spatio-temporal unfolding of audiovisual narrative. Those videos have emerged from their digital technological environment and their audiovisual heritage. The conventions, styles, tropes and genres – shot matching, three-dimensional animation, rolling credits and soap opera, for example – and the technical construction and production practices – shot sizes, mise-en-scène, the sonic construction of space, location shooting, for example – of the broader field of audiovisuality, have served as a productive counterpoint to my analysis of the penetration of audiovisuality by the specificities of digital technology. The analysis of online videos necessitated a critical approach that comprehended the features of audiovisuality and of digital technology.

In chapter 1, my review of the literature established Gene Youngblood as the progenitor of digital media arts scholarship. I noted there that, like that of several of

his successors, Youngblood's research focused on the future of digitally mediated cinema, as he termed it. He described synaesthetic cinema as 'an art of relations: the relations of the conceptual information and design information within the film itself graphically, and the relation between the film and the viewer at that point where human perception (sensation and conceptualization) brings them together' (Youngblood 1970: 82). In light of the preceding analysis, we can appreciate how digital audiovisuality is an art of such relations, comprising the interrelation of digital technology and audiovisuality in order to express the interrelation of the lived and virtual worlds, and of human and digital technology, which is made possible by digital technology and defines contemporary digital culture.

My emphasis throughout the study has been on the articulation of the specificities of digital technology in audiovisuality. This has involved a critical emphasis on the digital subversion of the conventions of audiovisuality. As I pointed out in relation to the narrative implications of the database in *Please Say Something*, the relationship between the original media from which the video's influences derive and their appropriation in the video, created a discursive tension between them. In the same way, we can appreciate in the videos studied how the subversion of audiovisual conventions by features specific to digital technology creates a discursive tension between them. Through the videos' subversion of our expectations of audiovisual form, a distinct form of audiovisuality and the autonomous digital audiovisual medium have been established.

7.1 Audiovisual Formalisations of the Glitch, Loop, Interface and Database

The analyses undertaken in the second section of the previous four chapters examined the relationship between the audiovisual formalisations of the glitch, loop, interface and database and the innate specificities of their mediating technology.

floVV, *Glitch* and *HARDCORE_GLITCH* formally articulate their underlying digital data, the flow of that data through the video-streaming interface, the agency of imaging and audiovisual technologies, and the typical opacity of those technologies when optimally functional, through glitches that subvert the conventions of the operation and use of their mediating technology. The composition of loops in *Kaizer, LoopLoop* and *Metro: Paris - Hong Kong underground* formally articulate the spatio-temporal multiplicity, variability and simultaneity that has been made possible by, and is specific to, its mediating digital technologies. The various formalisations of the interface in *zZz | Grip*, *Moonwalk* and *Noteboek* reflexively model the coextension of the virtual and lived realms that has been made possible by, and is specific to, the digital interface. *Wu Tang Clan Mixtape, My Favorite Color* and *Please Say Something*'s remixes combine a wide range of media samples or influences that cohere in the original audiovisual narratives that they produce. They formally articulate the specificities of the database that facilitates their production, whose abundance of media types and elements similarly coheres within this archival technology.

The formalisations of glitch, loop, interface or database in these videos articulate the innate specificities of their mediating technology – its fundamental data and the flow of that data, the spatio-temporal diversity that is engendered by the flow of its underlying data, the agency of its facilitating visual, sonic and audiovisual technologies based in that data, the confluence of the virtual and lived realms that it

makes possible, and the digital archive that underpins these technological processes. As a group, the videos articulate the innate scope of their mediating technology – what it is, how it works, how it occupies and models space and time, how it intercedes the lived and virtual worlds, facilitating their coextension, and how it stores and facilitates access to, the content of virtual worlds and digital culture. Consequently, they assert the innate technological specificities of the means of their mediation.

Glitch

The glitches in *floVV*, *Glitch* and *HARDCORE_GLITCH* articulate nuances of the innate specificity of their technological means of mediation, by modelling malfunction in the digital systems that underpin them. This wide range of visual and sonic glitches formally articulates the occurrence of error in their mediating technology, or the subversion of its conventional operation or use. Consequently, the glitches in these videos formally emphasise their technologies of mediation.

In *floVV*, the initial technological 'dropped frames' glitch and subsequent visual glitches pixellate and degenerate its sequence of images of a history of Western visual culture. Formalising the technological means of the video's mediation through the manifestation of its error, the glitches in *floVV* articulate the technological specificities of its medium – the digital data contained within the video's file and the technological means whereby that file is streamed online. The visual glitches in *Glitch* formally refer specifically to the imaging and audiovisuality technologies that underpin it, by subverting their conventional operation. These photographic and structural glitches, coupled with the jarring discordant glitch sounds of the video's soundtrack, draw attention to the digital technologies that mediate *Glitch* by formalising them in the video's narrative. Glitches dominate *HARDCORE_GLITCH*.

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The human beings that feature throughout the video are modelled through glitches, which take the form of chromatically over-saturated, exaggerated pixels. The video's soundtrack is similarly composed entirely of sonic glitches. The profusion of visual and sonic glitches in this video formally articulates its facilitating digital technologies.

Loop

The loops in *Kaizer, LoopLoop* and *Metro: Paris - Hong Kong underground* innovatively construct on-screen spatio-temporality. Formally articulating the fracturing, layering, repetition and simultaneity of multiple spatio-temporalities, the loop models the spatio-temporal multiplicity, variability and simultaneity that is made possible by the programmed data that underpins digital technologies. By formalising the digital technology's spatio-temporal diversity on screen, the loop articulates the specificities of its mediating technology.

Kaizer's dynamic collage-style composition of loops formally produces the video's spatio-temporal multiplicity, variability and simultaneity. Because of its juxtaposition of an increasing number of independently operating spatio-temporal loops, multiple temporalities coexist within the video's principal panning shot. *LoopLoop* fractures screen space in its stratification of a number of independently operating spatio-temporal loops. The on-screen correlation of these loops – which move in different directions, and at different speeds to each other – emphasises their spatio-temporal diversity. The changing 'focal length' of our view of the loops, oscillating between wide-shot and close-up, and the incorporation of still imagery, compounds the video's spatio-temporal variability. *Metro: Paris - Hong Kong underground* loops very short sequences of images, which are composited according to the rhythm of the corresponding looped sounds of the video's soundtrack. The

imbrication of visual loops through the depth of the screen augments the video's spatio-temporal diversity through the coexistence of multiple loops.

Interface

Formalising the interface, *zZz | Grip*, *Moonwalk* and *Noteboek* audiovisually model the reciprocal relationship between human and technology, the connection of the lived world to the virtual realm, and the exchange between them, which the interface facilitates in contemporary digital culture. Formally asserting these aspects of the interface, these videos articulate the innate specificities of their technological means of exhibition, or streaming.

The formalisation of the interface in *zZz | Grip* transposes the operation of this digital technology and its associated functions to live performance. The video reflexively formalises the interface – through which the human being and the virtual realm can interact – through an on on-screen performance that is itself rooted in their interaction. *Moonwalk* visually transposes the *YouTube* interface to video and reiterates a number of *YouTube* interface images through the depth of the screen. Its transposition of the *YouTube* interface mirrors that of the actual *YouTube* interface through which this video streams, thereby formally connecting the lived world that we occupy as we view the video, with the virtual space that exists beyond the interface. *Noteboek* also appropriates the *YouTube* interface, through hand-drawn animation. Using this interface, Lohbeck selects four video clips that consist of hybrid performances of live action and animated elements. Her selection of the video clips and their content model the interaction between, and co-existence of, the objects of the lived and virtual worlds. *Noteboek* thereby formalises the innate specificities of the digital interface.

Database

Wu Tang Clan Mixtape, My Favorite Color and *Please Say Something*'s remixes formally articulate the innate specificities of the database – an archive of an unprecedented diversity of media types and elements – that makes these media available to contemporary cultural practices, such as remix. These videos formally assert the coherent heterogeneity of their constituent elements, and thereby formally articulate the innate specificity of the database.

Wu Tang Clan Mixtape remixes a wide range of qualitatively and historically diverse samples taken from a history of the Wu Tang Clan's music and career. Through visual juxtaposition and nesting, the video asserts the heterogeneity of these samples, while the sonic elements nonetheless cohere within Eclectic Method's audiovisual remix of a number of the band's hip-hop tracks. *My Favorite Color* remixes a number of samples, taken from *YouTube* video clips of individual musical performances, into an original audiovisual composition. While the sonic aspects of the remixed samples form a coherent piece of music, their visual elements assert and maintain their heterogeneity through sequential replacement or juxtaposition. Developing its formal style from the remix, *Please Say Something* asserts the heterogeneity of its media influences in the production of an original audiovisual narrative. The video's formal emphasis on the diversity of its influences that derive from a wide range of media articulates the unprecedented diversity of media types and elements that the database makes available to contemporary digital culture and cultural practice. In their paradoxical coherence of diverse media samples or influences, these remix videos assert the heterogeneity of media types and elements that similarly cohere in the database.

7.2   Glitch, Loop, Interface and Database, and technology

The analyses undertaken in the third section of the previous four chapters examined the relationship between the audiovisual formalisations of the glitch, loop, interface and database in the videos and the operational specificities of their mediating technology.

The glitches in *floVV*, *Glitch* and *HARDCORE_GLITCH* articulate the operational specificities of their mediating technology by referring, through their 'dropped frames', image distortion, photographic, structural and sonic glitches and pixellation, to its conventional operation and use. The composition of loops in *zZz | Grip*, *Moonwalk* and *Noteboek* articulate the spatio-temporal multiplicity, variability and simultaneity that is formally and experientially specific to digital technology. Through their diverse formalisations of the interface, which involve communication and exchange between the virtual and lived realms, these videos formally assert the operational specificities of the interface – the liminal space that facilitates their interaction. The remixes in *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something* articulate the operational specificities of the digital database by formally emphasising the heterogeneity of their constituent media samples or influences and by remixing them achronologically. These videos formally articulate the operational specificities of the database – the randomly accessible, achronological and non-hierarchical archive of an abundance of digital media files.

The formalisation of glitch, loop, interface or database in these videos articulate the operational specificities of their mediating technology – the conventional operation of its fundamental data, the conventional use of its facilitating visual, sonic and audiovisual technologies, the spatio-temporal diversity that is specific to the operation of its underlying data, the communication and exchange

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between the virtual and lived realms that it makes possible, and the randomly accessible, achronological and non-hierarchical digital archive that underpins and facilitates all of these technological operations. As a group, the videos articulate the operational scope of their mediating technology – its typical function, how it is typically used, how it formally and experientially articulates space and time, how it facilitates communication and exchange between the lived and virtual realms, and how it makes pre-existing digital content available to the human user. Consequently, they assert the operational specificities of the technological means of their mediation.

Glitch

The glitches in *floW*, *Glitch* and *HARDCORE_GLITCH* relate to the digital technologies of their production according to a variety of, but nonetheless related, formal strategies. These videos demonstrate the scope of technologically centred issues that the glitch formally articulates in the audiovisual narrative and, as a result, the operational specificities of the videos' mediating technologies.

Despite the formal variation between them, the glitches in these videos – the 'dropped frames' glitch and those that distort the images in *floW*, the photographic and structural glitches in *Glitch*, and the visual pixellation and sonic glitches in *HARDCORE_GLITCH* – all indicate an absence of the expected functionality of their technologies. *floW* combines an authentic glitch that occurred in its digital video file and a number of contrived glitches that suggest errors in the media player that streams the video. Regardless of their ontological veracity, both types of glitches refer to these specific operations of their underlying technology. The sonic glitches in *Glitch* suggest that errors have occurred in the technology underpinning the soundtrack, whereas its photographic and structural glitches visually subvert the established

conventions of imaging and audiovisuality. These glitches refer to the conventional operation of the digital technologies that underpin the video and to their conventional use. The visual and sonic glitches that dominate *HARDCORE_GLITCH* refer to the digital specificity of its underlying technologies, through pixels and sonic aliasing artefacts that model the imprecision of digital data in its mediation of sonic and visual phenomena.

Loop

Exploiting the advanced capabilities of contemporary digital technology, which enable innovative formal constructions of space and time, the composition of loops in *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* engender complex on-screen spatio-temporalities that articulate the operational specificities of their mediating technologies.

Kaizer exploits the mutability of digital data to produce a dynamic collage of independently operating temporal loops that are composited within the video's principle panning shot. These loops articulate the operational specificities of the video's underlying technologies that are based in looped programmes that control the function of its digital data, which in turn, facilitate the composition of the video's complex spatio-temporality. *LoopLoop* exploits the mutability of digital data to stratify independently behaving loops that coexist on-screen. The on-screen relation of the loops emphasises their spatio-temporal diversity, thereby formalising this key feature of digitally mediated forms and experiences. *Metro: Paris - Hong Kong underground* exploits the mutability of digital data to imbricate a number of short duration spatio-temporal loops, so that they are layered through the depth of the screen. The videos' strategies of loop composition formally model the spatio-

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temporal multiplicity, variability and simultaneity that is specific to the operation of their mediating technology, both formally, in the digital arts and online space, and experientially, in our interaction with them.

Interface

zZz | Grip, *Moonwalk* and *Noteboek* formalise the interface through live performance, digital effects and animation. Despite their differing formal strategies, these videos are nonetheless related in their articulation of the technological specificities of the interface. Their formalisations of the interface articulate its operational specificity as the technologically mediated space that intervenes the lived and virtual realms.

zZz | Grip models the collaboration between those realms that the interface makes possible, through its live performance of a video-streaming interface and its associated functions. The video articulates these operational specificities of the interface through the on-screen reciprocal performance of the human and virtual components of interactivity, where the technological functionality of the interface circumscribes the actions taken by the human user. *Moonwalk*'s formal emphasis on the informational aspects of the *YouTube* interface also draws attention to the functionality of the interface, whereby it transposes digital information into a form that the user can understand. The video's recursion of interface images intercedes the virtual space that the video models and the lived space that the user occupies, formally reproducing the functionality of the interface through which these otherwise heterogeneous realms are linked. *Noteboek*'s formal appropriation of the *YouTube* interface, and the video clips that it facilitates access to, comprises performances involving the interaction of virtual objects and the objects and beings of the lived world. The video enables us to perceive the complex technologically enabled

association of, and communication between, lived and virtual spaces and objects that have been made possible by, and are specific to, the digital interface.

Database

The diverse formal strategies employed in *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something* assert the operational technological specificities of the database, as a randomly accessible, achronological and non-hierarchical archive of an abundance of digital media files.

Wu Tang Clan Mixtape's remix imposes narrative order on the achronological and non-hierarchical archive of digital files that is the database. Visually juxtaposing and nesting samples taken from historically and qualitatively diverse media sources, the video formally reinterprets the achronology of the database. As a result, it also formally models the random accessibility of its constituent files, as they are stored in the database. *My Favorite Color* refers explicitly to the *YouTube* database through its exclusive use of samples taken from *YouTube* video clips and its incorporation of hyperlinks to that database in the video's final shot. The video's samples are variously repeated and rearranged throughout the audiovisual composition, thereby formally articulating the randomly accessible, achronological and non-hierarchical archive of data that is specific to the database. *Please Say Something*'s appropriation of the remix as a formal style emphasises the diversity of its media influences. It formally responds to the convergence of the media that has been facilitated by the digital database. O'Reilly eschews the smooth visual rendering for which digital technologies tend to be used, in order to emphasise the diversity of media influences that cohere within the three-dimensional space of his video.

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7.3   Conceptual implications of the Glitch, Loop, Interface and Database

The analyses undertaken in the fourth section of the previous four chapters examined the relationship between the formalisations of the glitch, loop, interface and database in the videos and the conceptual implications that they draw into the audiovisual narrative. Because of the pervasiveness of our engagement with and through digital technology throughout digital culture, the glitch, loop, interface and database take on technologically specific conceptual significances. These significances extend beyond purely technological operations, but nevertheless develop from them.

The glitches that appear in *floVV*, *Glitch* and *HARDCORE_GLITCH* draw the conceptual implications of their mediating technologies – the idea of mediation, the conventions of the operation and use of its underlying technologies, and the ideology surrounding their conventional operation – into their audiovisual narratives. The various compositional strategies of the loop in *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* model the spatio-temporal multiplicity, simultaneity and variability that is specific to their mediating technologies. Their audiovisual narratives conceptually draw on our experiences of spatio-temporal diversity throughout digital culture. *zZz | Grip*, *Moonwalk* and *Noteboek* formalise the interface through the performative interaction of the lived and virtual worlds. By enacting the operational logic of the interface in this way, these videos draw the conceptual implications of our experiences of interactivity into their audiovisual narratives. *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something*'s remixes formally correlate diverse media samples and influences, and in so doing, emphasise their heterogeneity. By formally modelling the specificities of the database in this way, these videos draw its conceptual implications – the repository of

our shared cultural heritage, providing access to an unprecedented abundance of digital texts, objects and experiences – into their audiovisual narratives.

The formalisation of glitch, loop, interface or database in these videos draw the conceptual implications of their facilitating technology – the idea of mediation, the conventions of its operation and use, the ideology that is rooted in those conventions, spatio-temporal multiplicity, simultaneity and variability, the interaction of the lived and virtual realms, and the unprecedented abundance of media forms and experiences that it makes available – into their audiovisual narratives. Consequently, the videos articulate the conceptual implications of the technological means of their mediation.

Glitch

The glitches in *floW*, *Glitch* and *HARDCORE_GLITCH* demonstrate the essential self-referentiality of the glitch. In other words, they demonstrate how the glitch conceptually asserts the experiential specificities of our habitual engagement with digital technologies throughout contemporary culture.

The glitches in *floW* formally articulate aspects of the video's underlying technologies and consequently, conceptually implicate the technological processes of mediation that necessarily underpin it. By indicating an error in the video's digital file and suggesting a number of others in the technology that underpins its presentation, *floW*'s glitches draw the concept of its technological mediation into the video's narrative. The functional, photographic and structural glitches in *Glitch* transgress the operational limits, or the conventions, of its mediating technology. These glitches draw concepts related to the expected function or the conventional use of its mediating technologies into the video's narrative. The sonic and visual glitches

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that dominate *HARDCORE_GLITCH* formally subvert the ideology of error-free digital technologies that underpins digital culture. They draw this conceptual significance of the glitch into the video's narrative, by critiquing this ideology.

Loop

Given their formal emphases on the spatio-temporal loop, *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* enable us to perceive the spatio-temporal specificities of digital technology in their mediation of contemporary cultural forms and experiences.

Despite their diverse compositional strategies, *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* are related in terms of the scope of conceptual implications that their formalisations of the loop draws into their audiovisual narratives. *Kaizer*'s juxtaposition, *LoopLoop*'s stratification and *Metro: Paris - Hong Kong underground*'s imbrication of loops assert, according to various nuances of formal emphases, spatio-temporal multiplicity, simultaneity and variability. Their compositional strategies emphasise spatio-temporal diversity through the on-screen relation of several loops. Cohering within the space of each video, the spatio-temporal diversity of the videos' loops conceptually implicate the forms and experiences of digital technologies wherein similarly multiple, simultaneous and variable spatio-temporalities coexist. *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground*'s formalisations of the loop draw our experiences of engaging the diverse spatio-temporalities of digital culture into their audiovisual narratives.

Interface

The formalisation of the interface in *zZz | Grip*, *Moonwalk* and *Noteboek* draws its conceptual significances, which derive from our experiences of cultural engagement through digital interfaces, into their audiovisual narratives. These derive from the role of the interface as the ingress to the vast digital realm that we engage from the lived world, and as the liminal space between them, which facilitates communication and exchange between human beings and the virtual realm.

In the live action performance of the interface in *zZz | Grip*, the actions and behaviour of the on-screen performers are circumscribed by the limits of the technological operations that they perform. This video formally articulates the necessary cooperation, and negotiation, between the human and technological counterparts of interactive processes. Its formalisation of the interface is conceptually rooted in, and therefore implicates, these experiences of interactivity in its audiovisual narrative. In its formal emphasis on the file information aspects of the *YouTube* interface, *Moonwalk* conceptually emphasises the user experience of media access, and of cultural engagement, through the interface. Its recursion of images of content-less interfaces, further emphasises the user experience by focusing on the information about the interfaces' (non-existent) files, rather than on their content. By formally asserting the liminality of the interface, the video draws the conceptual implications of experiences of interactivity through the interface into the video's narrative. In *Noteboek*, the interface and the videos that it facilitates access to, formally integrate virtual and lived world objects and spaces, which interact with each other. The video's appropriation of the *YouTube* interface provides the conceptual frame within which their on-screen interaction can conceivably occur, and thus draws these conceptual implications of the interface into its audiovisual narrative.

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<u>Database</u>

The formal remix strategies of *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something* implicate the conceptual significances of the database – the repository of our shared cultural heritage, which offers an unprecedented abundance of the texts, objects and experiences that we engage throughout digital culture – into the audiovisual narrative.

Wu Tang Clan Mixtape's remix of samples taken from various media types and periods, spanning early 1990s home video to recent commercial film, asserts the breadth of the mediated history of the band that is stored in the database. Its formal interrelation of these samples, through which the remix traces a random access journey, draws the conceptual implications of the database – the extensive source of its constituent samples and the repository of our shared cultural heritage – into the video's narrative. *My Favorite Color* remixes samples derived from Kutiman's selection of video clips of individual musical performances on the *YouTube* database. The final shot is embedded with links to these originating video clips. These features of the video introduce the conceptual implications of his, and correspondingly our, engagement with the database – the human enframing of its abundance of media files – into the video's narrative. *Please Say Something* remixes diverse media influences within an explicitly digital three-dimensional rendering of space. Their coexistence within this digital space conceptually asserts the parity of all digitally produced and digitised historical media, which similarly coexist in the digital database. The remix style of this video conceptually asserts O'Reilly's exposure to the database, which has engendered his innovative formal interpretation of the remix, and its seemingly paradoxical formal coherence.

7.4   Glitch, Loop, Interface and Database (Remix) narrative

The analyses undertaken in the fifth section of the previous four chapters examined the relationship between the audiovisual formalisations of the glitch, loop, interface and database in the videos and their other content. The interrelation of the innate and technological specificities of the glitch, loop, interface and database, and their corresponding conceptual implications, with the subject matter of the videos produces narratives that relate aspects of the conditions that are specific to contemporary digital culture.

The glitches in *floVV*, *Glitch* and *HARDCORE_GLITCH* formally interrelate with the images taken from a history of Western culture, footage of urban scenes, and human beings, respectively. Their interrelation produces innovative narratives that relate the impact of digital technologies in contemporary arts practices and our cultural heritage, on the urban systems that underpin our daily lives, and on interpersonal engagement through the digital network. *Kaizer*, *LoopLoop* and *Metro: Paris - Hong Kong underground* present footage of various aspects of urban life, the public park, urban street scenes and the underground rail system, through composited spatio-temporal loops. Interrelating the spatio-temporal specificities of digital technology with scenes from urban culture, the videos' narratives relate the impact of digital technologies in these aspects of contemporary culture. *zZz | Grip*, *Moonwalk* and *Noteboek* interrelate the interface with the objects and beings of the lived world and the objects and spaces of the virtual realm. Consequently, their narratives are discursive of the technocultural significance of the interface, whereby it facilitates the communication and exchange between the lived and virtual realms. The remix narratives in *Wu Tang Clan Mixtape*, *My Favorite Color* and *Please Say Something* interrelate historically and qualitatively diverse samples, individual musical

performances, and multiple media influences, respectively. Their documentary, musical and dramatic narratives articulate the accessibility and universality of the database's cultural archive that is central to contemporary digital culture.

The interrelation of the formal glitch, loop, interface or database with the other content of the videos produces narratives that express the impact of digital technologies in contemporary digital culture – in arts practices and cultural heritage, in the urban systems and digital networks that underpin our daily lives, in our interpersonal engagement, in our experiences of space and time, our interaction with the objects, spaces and experiences of the virtual realm, and the diverse cultural heritage that it makes available. The videos articulate the complex narrative significance of the integration of the formal, technological and conceptual specificities of their mediating technologies with their other content. The videos variously present our cultural heritage, urban life, our selves, urban spaces and systems, and cultural engagement, through the lens of digital technologies – formalised through the glitch, loop, interface or database. Consequently, these features of digital technology narratively articulate the broader cultural significance of digital technology.

Glitch

In *flo\/\/*, the interaction of a number of glitches with the video's sequence of images depicting aspects of a history of Western visual culture introduces the conceptual implications of the glitch – as the evidence of the video's mediation – to the video's narrative. As a result, *flo\/\/*'s narrative relates how our access to our shared cultural heritage, and indeed, to contemporary culture, is mediated through digital technologies. The functional glitches in *Glitch* suggest that errors have occurred in

the technology underpinning the video, and its photographic and structural glitches emphasise the conventions according to which its visual and audiovisual technologies are typically used. The video's interrelation of functional, photographic and structural glitches with images of urban life produces a narrative that emphasises the systems that similarly underpin urban spaces and asserts that urban life is mediated by fallible technologies. The abundance of glitches in *HARDCORE_GLITCH* highlights the inherent imprecision of digital technologies in their mediation of sonic and visual phenomena. The video's formal melding of glitches with the human beings that it features produces a narrative that relates how our engagement with the digital network, and with each other through that network, involves a digitised – and thus, imprecise – version of our selves.

Loop

Kaizer, *LoopLoop* and *Metro: Paris - Hong Kong underground* formally integrate spatio-temporal loops with live action footage of aspects of urban life. These loops formalise the spatio-temporal multiplicity, variability and simultaneity that is specific to forms and experiences that are underpinned by digital technology. In those videos, the integration of spatio-temporal loops with footage of a public park, urban scenes and scenes from an underground rail system, respectively, introduces the conceptual implications of the loop – the spatio-temporal diversity that digital technology has introduced to digital cultural forms and experiences – to the videos' narratives. This enables us to perceive and thus, to consider, the digital mediation of the lived cultural experiences that these videos portray. The videos' narratives relate how aspects of our lived culture are mediated by digital technologies. Rooted in the spatio-temporal loop, these narratives articulate the increasing interrelation of virtual and physical

space, and of human beings and digital technologies, which defines contemporary digital culture.

Interface

zZz | Grip's live performance of the interface produces a complex formal integration of technology and human, and of the virtual and lived realms. It produces an innovative narrative that relates the specificities of the processes of interactivity through a performance in which human performers literally embody digital operations that likewise dictate the parameters of their performance. *Moonwalk* formally and conceptually emphasises the aspects of the digital interface that express information on digital data to the user in the lived world. The correlation of these aspects of the interface with the video's indeterminate presentation of the virtual realm articulates the heterogeneity of these realms that the interface intercedes. The video's narrative articulates the human enframing of digital data that is central to processes of interactivity through the interface. In *Noteboek* Lohbeck's interaction with the animated *YouTube* interface, and the four video clips that she selects through the interface, model the communication, and interaction, between objects and beings of the lived and virtual worlds. This produces a multi-layered narrative that articulates the processes of exchange between these worlds that the interface facilitates in contemporary digital culture. Because they involve the formal interrelation of the beings, objects and spaces of the lived and virtual worlds, the videos' narratives audiovisually reproduce the operation of the interface.

Database

Wu Tang Clan Mixtape interrelates a wide range of samples taken from various periods in the mediated history of the career of the band, formally asserting the breadth of the band's mediated history that exists on the database. The video's interrelation of samples produces an innovative documentary narrative that exploits this repository of our shared cultural memory of the band to prove their early audacious claims to musical and professional superiority to have been accurate. *My Favorite Color* is a dual-faceted remix, in which its combined visual and sonic remixes of samples differ in their emphases on those samples. This draws the variable remixability that is specific to the database into the video's narrative. Developing the samples beyond their initial significance as individual performances, this regenerative mashup produces an original audiovisual musical narrative, while it also facilitates access to these samples on the *YouTube* database. *Please Say Something*'s remix of diverse media influences conceptually implicates the database in its formal style. Rooted in the universality of the database's archive of media, the narrative of domestic violence that the video constructs is similarly universal. The video establishes a discursive tension between the original media that influenced its remix style and their appropriation in its narrative, emphasising the gravity of the story that it relates.

7.5   Contingency, Parallels, Correspondence and Reciprocity

In the preceding four chapters I addressed and analysed the innate, technological, formal, conceptual and narrative aspects of the glitch, loop, interface and database in online video. Through the course of their analysis, the contingency of these features on one another became clearly evident. As the videos demonstrate, the innate, technological, conceptual and narrative aspects of the formal glitch, loop, interface or database are contingent upon, and inform, its other aspects. In addition, parallels can be identified between the innate, technological, formal, conceptual and narrative aspects of the glitch, the loop, the interface and the database.

For example, some of the structural glitches in *Glitch* reverse narrative time. *Please Say Something* also features the reversal of narrative time. The structural glitches in *Glitch* were significant to the discussion of the glitch because their reversal of narrative time subverts the conventions of audiovisuality. However, the reversal of narrative time in *Please Say Something* was significant to the discussion of the database because of its appropriation of a trope of both cinematic and interactive narrative. That was pertinent to the discussion because the video's remix of heterogeneous media influences formally responded to the innate specificities of the database. It is important also to note that, whether critically engaged as a structural glitch, or as an appropriated audiovisual or narrative trope, the reversal of time in these videos is also spatio-temporally significant.

Other operational glitches also feature in *Please Say Something*, but their significance was identified and discussed as part of the video's digitally specific rendering of space, within which its wide range of media influences formally coexist. This example raises an important associated point. Spatial concerns permeate the project of analysis, beyond the pointed discussion of the spatio-temporality of the

videos in chapter 4. For example, spatiality informs the discussion of the database in chapter 6 because the spatial coherence of heterogeneous media files and elements is an innate specificity of the database. Also, sonic glitches feature in *LoopLoop*, but as they result from reverse looped sound, they were discussed in terms of their spatio-temporality, rather than of the glitch.

In addition, we can identify correspondence between the innate, technological, conceptual and narrative aspects of one formal feature (either glitch, loop, interface or database) and those of the other formal features examined, whereby they share similar conceptual implications and narrative significances. For example, the structural glitches in *Glitch*, which formalise the video's underlying systems, interrelate with the multiple urban scenes that the video presents. Their narrative interrelation expresses how urban spaces are also underpinned by technological systems that similarly mediate urban life. The loops in *LoopLoop* and in *Metro: Paris - Hong Kong underground* similarly draw attention to the digital technologies that underpin them. Interrelated in these videos with multiple urban scenes, loops narratively relate the systems that underpin the videos with those that physically and virtually underpin urban life. Both the loop and the glitch reveal the videos' underlying technologies and systems. Their narrative interrelation with the videos' other subject matter analogically reveals their underlying systems.

Also, I analysed the loops that feature throughout *Metro: Paris - Hong Kong underground* in terms of the formal, conceptual and narrative implications of the repetition that they produce. The video's loops are narratively significant because they formally express the repetition that is a feature specific to digital culture, whereby cultural content is reposted – or repeated – across the digital network. However, repetition also features in *My Favorite Color*, whose significance I analysed

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in relation to the database. Kutiman's remix of individual musical performances variously repeats samples in his audiovisual composition. The repetition of samples formally asserts the technological specificities of the database, by expressing the random accessibility of its files. This correspondingly conceptually implicates the database in the video's narrative. *floVV*'s narrative interrelation of glitches with images that depict a history of the Western visual arts relates the cultural impact of digital technologies that store, and so facilitate access to, our shared cultural heritage. In this case, the glitch formally and conceptually refers to the specificities of digital data, and to the specificities of the interface and database that are rooted in that data.

Throughout the analysis of the sample of videos we can identify reciprocity between the formal, innate, technological, conceptual and narrative significances of the glitch, loop, interface and database. For example, the glitch and the loop, which articulate the presence of digital data and the flow of that data, respectively, assert complementary aspects of technological mediation. Also, the spatio-temporal multiplicity, variability and simultaneity of digital technological forms and experiences that are articulated through the loop are also a central feature of the interface – given its role as the ingress to the virtual realm within which these spatio-temporal forms and experiences (co)exist. In addition, the loops that dominate the three videos studied in chapter 4 formally, conceptually and narratively assert the coexistence of diverse constructions of space and time in the virtual realm. The coexistence of diverse elements is also fundamental to the innate specificity of the database. Also, our interactivity with the virtual realm through the interface familiarises us with the specificities of the glitch, the loop and the database, as they are all essential features specific to that realm.

The contingency, correspondence, parallels and reciprocity between the innate, technological, conceptual and narrative aspects of the formal glitch, loop, interface and database that I have identified throughout the study, highlight the coherence of these aspects of digital technology within and among the videos analysed in this thesis. This distinguishes the videos analysed as forming part of a distinct sphere of media practice, rather than merely serving as individual case studies for the current thesis.

Chapter 8:   Conclusion

In the introduction to this thesis I queried whether, in contemporary online video, we could account for the autonomous digital audiovisual medium. My research proposed the potential digital audiovisual medium as a complex interrelation of the conceptual implications and corresponding narrative significances of the formalisation of digitally specific technological features in audiovisuality. Having established digital data, the loop, the interface and the database as the essential features of the digital technologies that mediate online video, my subsequent analyses of the conceptual and narrative implications of their formalisation generated compelling evidence of the autonomy of the digital audiovisual medium.

The term 'medium' refers to the formal and cultural practices that evolve around the creative use of a particular mediating technology. Digital data, the loop, the interface and the database are complementary aspects of the technological mediation of online video. Thus, they are contingent on one another, and together constitute the technology of online video.

The formalisation of glitch, loop, interface and database in the videos analysed, articulates the innate specificities of their mediating technology – its fundamental data, the flow of that data and the visual, sonic and audiovisual technologies that it underpins, the spatio-temporal diversity, the confluence of the virtual and lived realms, and the abundance of media that it has introduced to digital culture.

Those formalisations simultaneously articulate the operational specificities of online video's mediating technology – the conventional operation and use of its facilitating digital visual, sonic and audiovisual technologies, the spatio-temporal

diversity that it manifests, the interaction of the virtual and lived realms that it facilitates and its randomly accessible, achronological and non-hierarchical digital archive.

Those formalisations also draw the conceptual implications that are specific to online video's mediating technology into the audiovisual narrative – the idea of mediation, the conventions of mediation, the ideology that derives from those conventions, and the spatio-temporal multiplicity, simultaneity and variability, interactivity, and unprecedented access to media forms and experiences made possible by that mediating technology.

The interrelation of the glitch, loop, interface or database with the other content of the videos analysed produces narratives that express the impact of digital technologies in contemporary digital culture – in contemporary arts practices and cultural heritage, in the urban systems and digital networks that underpin our daily lives, in our interpersonal engagement, in our experiences of space and time, in our interaction with the objects, spaces and experiences of the virtual realm, and in the abundance of cultural content that it makes available.

My adaptation of Gaudreault and Marion's model established these five features – innate, technological, formal, conceptual and narrative – as the essential criteria of the autonomous digital audiovisual medium. In addition to the interrelation of the glitch, the loop, the interface and the database in the mediation of online video, as we have seen throughout the research, these criteria of digital medium autonomy are also contingent on one other because they are reciprocally defined. As we have also seen, comparisons can be drawn between the formal, conceptual or narrative operation of two or more of the technological features of online video's mediating technology.

Considered comprehensively, we can appreciate how the twelve online videos analysed throughout this thesis assert the autonomous digital audiovisual medium and consequently, establish a digitally specific audiovisual practice, which I term digital audiovisuality.

8.1   Implications of Research

The implications of this research project into online video are wide-ranging. Fundamentally it identifies and critically analyses digital audiovisuality - a digital arts practice in online video that has, hitherto, been overlooked by digital media arts scholarship.   This is an important issue because, given the rapidly increasing popularity of online video production and reception in the contemporary period, online video is a valuable source of knowledge for what it reveals about digital culture.   By analysing the technocultural specificities of online video, this project of research brings to light the interrelated formal, conceptual and narrative particularities of this practice as they articulate many of the particularities of the contemporary cultural period.

Key to this subject and to the discussion is the significance of the digital network as the institutional context from which digital audiovisuality has emerged, as the site of our access to and engagement with online videos, and crucially, as the entity that increasingly mediates so many aspects of our lives and shared culture.   As a   result,   this   research   project   importantly   contextualises   an   innovative   and contemporary digital audiovisual practice in relation to the culture from which it has emerged.

In identifying the glitch, the loop, the interface and the database as key features of this innovative digital audiovisual practice, this study also acknowledges a number of related formal features and conceptual impulses of creative practice throughout the history of the media arts.   While briefly tracing the similarities between these formal features of digital audiovisuality and their potential predecessors in the analogue media arts, it comprehensively agues for the differences between them.   While similar formal elements as those that relate to the glitch, the

loop, the interface and the database can be found throughout the history of arts practices, the preceding analysis identified and argued for the specificity of these elements of a digital arts practice as they relate to a culture that relies on the digital network. Crucially, it is the specific technocultural context of digital arts practice and culture against which those recurring (albeit according to various formal manifestations and conceptual impulses throughout the history of the media arts) features appear - in the online videos studied - that makes the preceding discussion important for its illumination and discussion of issues that are specific to contemporary digital culture and to the contemporary digital arts.

The similarities between the formal features under discussion in this thesis and related formal features in media arts of the analogue period provide a useful point of departure for the analysis of the digital specificity of these features of the digital arts. An initial consideration of similar formal manifestations and conceptual impulses in analogue creative practices has enabled a pointed project of analysis into the particular technocultural context of digital audiovisuality.

It is this contextual perspective on the specificity of media arts practices that is key to the medium autonomy stage of Gaudreault and Marion's model of the genealogy of media. In its renewal of perhaps familiar formal tropes, digital audiovisuality asserts the specificity of these features to the digital technologies that underpin the videos' production, distribution and reception, and our social, cultural and political lives. By reigniting themes of mediation, error, spatio-temporal variability, liminality, the representation of reality, appropriation, the archive and cultural memory, and positioning them in a new context, the online videos studied enable us to consider such themes against the backdrop of contemporary digital culture. Because of this, this study is a valuable source of knowledge on the

relationship between this contemporary arts practice and the network - the institution of its production, distribution and reception and increasingly, of our shared culture.

The analysis of online videos critically penetrates the fundamental specificity of their production, distribution and reception on the digital network, considered in relation to its centrality in digital culture. Accordingly, this research project is a valuable source of knowledge on the social, cultural and political particularities of our shared culture as it is articulated in the contemporary digital arts.

It has identified and analysed how the articulation of error, mediation and the subversion of the dominant ideology of digital culture - that of infallible technology - through glitch, draws these themes into audiovisual narratives featuring the beings, objects and space of the lived world. As a result, glitch videos are discursive of the penetration of digital technologies into our cultural heritage, our lived spaces - such as the city - and in our social interaction. The spatio-temporal variability introduced to online video by the loop introduces recognisably digital constructions of space and time to scenes depicting the beings, objects and spaces of the lived world. By combining digital and lived registers of space and time on screen, loop videos foreground the new experiences of space and time that digital technologies have introduced to the common cultural experience of the network. Formalisations of the interface in the videos studied introduced concepts of liminality, the real and the virtual and the possibility of interactivity between them, to the beings, objects and space of the lived world. In doing so, interface videos are discursive of these issues that are central to the operation of digital culture. Remix practices that underpin the database videos studied bring its conceptual specificities - those of non-hierarchy, random accessibility and an unprecedented abundance of, and access to, our shared cultural heritage - to bear on their documentary, fiction and music video narratives.

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The analysis of online video in this way has enabled a discussion of the political, social, cultural particularities of this period in relation to the technologies that increasingly intercede in these aspects of our everyday lives. Considered together, the formal features of digital audiovisuality - the glitch, the loop, the interface and the database - conceptually and narratively assert the social, cultural and political impact that has been wrought by the increasing centrality of digital technology in modern life - in other words, its technocultural specificity.

The study adapts Gaudreault and Marion's model of the genealogy of media, which they test and establish in relation to cinema, for application to online video. By reinterpreting the model in this way, this research project proposes and critically exercises a coherent framework for the analysis of any of the network based digital arts, as they relate to broader technological and political, social and cultural concerns. The analytical model developed in this thesis makes a significant contribution to digital arts scholarship because it offers a useful working model that can be adapted by future researchers of online video, or any of the digital media arts, for the analysis of those arts as an articulation of their medium and thus, of their technocultural specificities.

By recontextualising the trajectory of the field of digital media arts scholarship in light of the stages of medium development established by Gaudreault and Marion's model, this study has also importantly redefined historical research into the digital media arts. Taking critical responses to the development of digital technology from the twentieth to the twenty-first centuries as its central premise, the review of the literature usefully identified a productive tension between the involvement of digital technologies in the practice of arts and culture, and conceptual and critical responses

to their use.   Correspondingly, the review established a critical methodology of analysis for the project that informed its close textual analysis of online videos.

This research project is therefore an important record and analysis of a particular digital arts practice - digital audiovisuality - that is specific to this particular period in the trajectory of digital culture.   Given its critical methodological perspective, it also provides an important record and analysis of the social, political and cultural specificities of the recent period of digital culture.

The problem of this thesis was two-fold: can we account for the digital audiovisual medium as an autonomous medium *and* if we can, how do we account for the digital audiovisual medium as an autonomous medium? The methodological response to the problem was similarly two-fold: the analysis of online videos in order to answer the question simultaneously established a methodology appropriate for answering the question. Since I embarked on this project of research in 2009, other theorists of digital media, similarly concerned with online video, have proposed and implemented various methodologies and theoretical models for the analysis and establishment of its specificities.

In 'Vision Possible: A Methodological Quest for Online Video', Stefan Heidenreich's research identified three 'exemplary forms' that demonstrate the technological and formal specificities of online video:

> [t]he parasite mode, which might borrow from the aesthetic of games and talk shows at the same time. [...] A second format will build on the increasing embeddedness of images in the real world. This process is facilitated by a growing segmentation of the image into a composite of various layers of metadata and links. [...] Once we become accustomed to these images, it will be very difficult to recall a state when the visual world was not constantly warped by a layer of data. There remains the third possibility of a collaboratively created visual world. This world would be built, like Wikipedia or the newer *WikiLeaks*, on the surplus-work of users. (2011 :23)

The first mode that he describes is formally defined, the second is technologically defined, and the third is socio-culturally and practically defined.[201]

In 'Objets Propagés: The Internet Video as an Audiovisual Format' (2011), Gabriel Menotti attempts to define the specificities of online video as an audiovisual format. In response to the digital convergence of media, he defines the internet video

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[201] Roel Wouters's *Now Take a Bow* (2010), mentioned in chapter 4 is an example of a crowd sourced, or digitally collaborative, production.

format through its 'dynamics of consumption, understood not only as a particular viewing regime, but as the whole structure of diffusion employed – intentionally or not – into bringing the work to the public', rather than its 'specific language or subject' (Menotti 2011: 70). Focusing on this 'different regime of visuality' (*Ibid.* 71), he attempts to determine the elementary characteristics of the audiovisual language in the context of the socio-cultural specificities of digital mediation.

In 'Web Video and the Screen as a Mediator and Generator of Reality', Robrecht Vanderbeeken focuses on the 'cultural backdrop' of 'web video' that considers the mobility of the screen and its unprecedented centrality in contemporary digital culture, as it 'mediates our perception of reality, and it generates another reality in a new, mediated environment' (Vanderbeeken 2011: 35). His research examines how 'the screen is evolving into new technological forms that generate a remarkable and eye-catching reality of their own, a new world' (*Op. cit.*).

Heidenreich distinguishes specific online video practices through either formally, technologically, or socio-culturally centred methodologies of analysis. Menotti's research focuses on the regime of visuality that distinguishes online video from other forms of audiovisuality, taking into account the impact that the digital technological context of online video streaming has on video viewing. Vanderbeeken theoretically focuses on the mobile screen as the distinguishing feature of online video, thereby taking into account the formal features that emerge in response to the ubiquity of the screen in contemporary digital culture. These contemporaneous studies of online video variously employ some of the features of digital technological practice that I find central to the problem of the medium.

As I argued in the above discussion, the technological specificities of a mediating technology and the formal and conceptual implications that they draw into

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audiovisual narrative are contingent upon one another. Therefore, to attempt, as Heidenreich, Menotti and Vanderbeeken have done, to disconnect one or two of these essential features of a medium from the others, and to ignore their relations of contingency with them, is to take a blinkered methodological perspective to the study of online video.

The methodology that this project of research proposed and implemented enables a comprehensive understanding of media and their practices and is suited, given appropriate adaptation – as I adapted Gaudreault and Marion's model – for the particular object of study, for the study of media practices and forms in the virtual realm. Rather than depending on outmoded methodologies – as Wands counselled against – it uses tools of analysis of the formal, conceptual and narrative aspects of the media text that are based on the technological specificities of the digital technologies of mediation. Gaudreault and Marion assert that 'a medium's identity is in part composed of permanent features but that all media are engaged in a process of constant development' (2002: 15). In light of this, the research methodology established in this thesis would be useful not only for the study of other digital media practices and forms, but also for the study of the future development of the digital audiovisual medium and of future developments in online video practices in general.

Cubitt noted that: 'The challenge at the turn of the millennium is to develop an appropriate, specific and material vocabulary for digital criticism' (2000: 92). Having established an appropriate critical vocabulary and methodology for the selection of online video from the field of practice and for the analysis of its digital specificity, which is rooted in its contemporaneous technological and cultural dimensions, this project has established how the digital audiovisual medium is articulated in online video.

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Appendix

Analogue versus Digital Technological Mediation

Analogue varieties of media technology, such as those which involve electronic processes, analogue videotape or audiotape for example, are based on electrical signals or waveforms that are continuous physical phenomena that vary over time. In their simplest form they can be compared to a sine wave (see Fig. X.1).
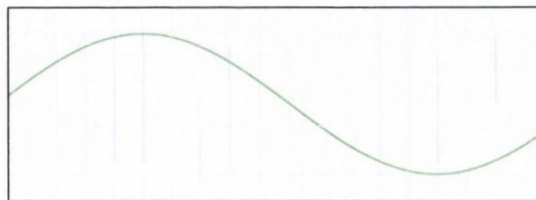

Fig. X.1 An Analogue Signal

In the case of an analogue electronics-based medium that encodes sound, for example, the electronic signal that is recorded on, and therefore stored in, a strip of audiotape will accurately reproduce the wave that was formed by the original sound. The encoded analogue signal will replicate both the frequency and the amplitude of the original sound wave. The term 'frequency' refers to the number of cycles that the sound wave completes per second, and the term 'amplitude' refers to the maximum absolute value reached by that sound wave. Therefore, the sound wave, as stored in the strip of analogue audiotape, will behave in the same manner as the original sound wave that it replicates.

Analogue film technology, on the other hand, involves chemical processes. This type of technology is based on the film strip, which is a strip of celluloid that has been coated in a photosensitive emulsion. When the film strip is exposed to the light that enters the film camera through the lens aperture, or opening, the photosensitive emulsion records, or stores, the varying levels of light that are present in the scene that is in front of the camera. This creates a latent image of that scene on the surface

of the film strip. This latent image must then be processed in order to generate a visible film image, which will form one frame of the film when it is projected.

Whether based on electronic or chemical processes, analogue media technology record or store reproductions of naturally occurring phenomena such as sound or light waves. For this reason, the technology that mediates sensory phenomena in this manner is termed 'analogue'.
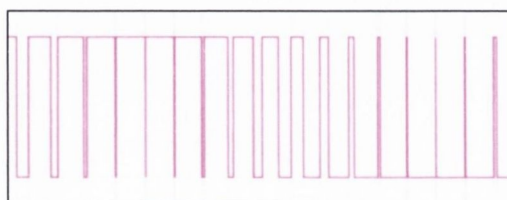

Fig. X.2 A Digital Signal

Digital signals are physical signals that represent a sequence of discrete values; they are non-continuous phenomena that change over time in discrete steps (see Fig. X.2). Digital technology in its simplest and earliest form was based on a switch, which is an electromechanical device, and is used to control contact continuity between two electrical conductor points. The final output of a digital system based on this kind of electromechanical technology would be based on two possible values where these points would either be connected together by the switch's internal contact mechanism, in a closed position, or not connected together by the switch's internal contact mechanism, in an open position.

Modern digital systems are based on solid-state gate circuits where the gate in closed position is represented by the number '0', and the gate in an open position is represented by the number '1'. Digital systems only recognise data expressed in binary format, so-called because it is composed of two digits: 1 and 0, so it is necessary to convert natural phenomena such as sound or light, or the electronic waveforms derived from analogue media systems, to digital signal representations of these phenomena.

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Using an example from sound reproduction, we can distinguish the analogue and digital mediation of sensory phenomena. Analogue audio technology, such as a microphone, records a sound, converting it to an electronic signal of continuously varying voltages. Similarly, analogue audiotape represents the original sound wave recorded through the microphone through the continuously varying voltages of the electronic signal, which are encoded in the audiotape. On the other hand, a digital system 'reads' only binary data, so it is necessary for that system to be able to interpret the continuously varying voltages of the signal that is produced by a microphone, or that is encoded in analogue audiotape, in terms of digital binary data. Therefore, in terms of sound reproduction, the representation of a sound captured in the lived world by digital means is a two-fold process: a sound wave is first converted to an electrical signal, which is then digitised by a digital system.

To convert the signal to digital binary code, it is necessary for the digital system to read, or sample, the values of the measurement of the amplitude of the sound wave at regular points. Through this process of 'sampling' each sample of the audio wave is ascribed one of a fixed number of numeric values so that it can be stored in and processed by a digital computer system. This phase of the analogue to digital conversion involves what is termed 'quantisation', which is the process of approximating the continuous range of values present in the original sound wave in terms of the comparatively small set of discrete numeric values available to the digital system.

Analogue media signals are similarly converted to digital signals through the dual process of digitisation and quantisation, which converts the continuous electronic signal to a sequence of discrete samples that is encoded in numeric values. This kind

of media technology gives a digital interpretation or representation of naturally occurring phenomena or, of analogue reproductions of naturally occurring phenomena.

Digital representations of sensory phenomena reproduce those phenomena through the discrete values of binary data, a process that produces a more or less accurate representation of those phenomena, depending on the magnitude of the range of numerical values involved. Digital media technologies produce a mathematic approximation of the original phenomenon, rather than its correlative, as is the case in so-called analogue media technologies such as the photographic emulsion in film or the electronic signal in video, for example.

A/B dissolve:
A/B dissolve is a command in computer based audiovisual editing whereby a dissolve transition intercedes between two shots, in this case, shot A and shot B. For an explanation of the dissolve transition, see chapter 4.

Aerial shot:
Aerial shots are a technique of audiovisual production whereby the camera occupies an elevated position over the scene.

Aliasing:
An inadequate sampling bandwidth creates an alias, a sonic artefact that distorts the sound being digitally reproduced. See the Nyquist–Shannon sampling theorem.

Apple DOS:
Apple DOS was the family of disk operating systems for Macintosh's *Apple II* series of microcomputers from 1978 to 1983.

Avatar:
An avatar is a two-dimensional or three-dimensional graphical representation of a user's identity in Internet forums and other online community spaces, or in games or virtual worlds.

Chronophotography:
Chronophotography is a Victorian photographic technique used primarily for scientific motion studies. It captures movement across a number of still frames of printed photographic material.
See the work of Étienne-Jules Marey (1830-1904) and Eadweard Muybridge (1830-1904), for example.

Codec:
A codec is a computer programme or device that is used to encode or decode a digital data signal or stream.

Collage film:
Collage film is a style of film production that juxtaposes elements derived from found - or pre-existing - film footage, from a number of sources.

Colour grading:
Colour grading is the process of altering and enhancing the colour of an image, whether electronically, photo-chemically or digitally.

Continuity editing:
Continuity editing was developed in order to elide the inherent discontinuity of the editing process and to establish a logical coherence between shots.

CPU:
A CPU (central processing unit) is the computer hardware within which the instructions of a computer programme are carried out.

Crash zooms:
A crash zoom is an in-camera visual technique wherein the camera zooms in very rapidly on a subject.

Cross-dissolve:
Cross-dissolve editing is a method of editing in audiovisuality that creates a transition between two images, whereby the second image is gradually superimposed over the first image until it eventually supplants it. Cross-dissolve editing offers a more graduated transition between images than the conventional cut.

Cyberspace:
'The space of virtual reality; the notional environment within which electronic communication (esp. via the Internet) occurs.' - *OED online* (www.oed.com)

Datamoshing:
Datamoshing is the intentional corruption of the algorithms used to compress digital video files. It deteriorates the video image into pixels, which visually bleed into one another, creating a swirling or morphing visual effect that eradicates any semblance of the original image.

Descriptive metadata:
Descriptive metadata is the information that classifies the data content of a digital file.

Diegesis:
Diegesis is the story world within which the audiovisual narrative takes place.

Diegetic location sounds:
Diegetic sound is any sound presented in an audiovisual text, such as a film or a video, as though it originated within the film or video's world.

Digitality:
Nicholas Negroponte's concept of the condition of living amongst and through digital technologies that defines digital culture, expounded in his book *Being Digital* (1995).

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DJing:
DJing is the live playing and mixing of vinyl records, and more recently, digital music files, typically at hip-hop and Electronic Dance Music (EDM) events.

Establishing shot:
An establishing shot in audiovisuality is usually a wide or long shot that sets up, or establishes the scene. It is usually positioned at the beginning of a scene.

Facebook:
Facebook is an online social networking service.

Fast cutting:
Fast cutting is a type of audiovisual editing technique that concatenates several consecutive shots, each of very brief duration.

Feedback:
Feedback occurs when the output(s) of a system is/are fed back into the system as input(s), forming a circuit or 'feedback loop'. See: Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (1948).

Focal length:
Focal length in lens-based media is the distance between the centre of the lens and its focus – I use the term in this section to describe the visual effect in *LoopLoop* that mimics the view through an oscillating zoom lens on a camera.

Footage:
Footage is a term that emerged in audiovisual practice to refer to a length of film (originally measured in feet) used to shoot a scene. It endures in contemporary audiovisual practice in extended usage, where it refers to the audiovisual material that has been recorded through a camera, whether digital or analogue.

Found Footage:
The term 'found footage' refers to pre-existing film footage that is appropriated and reused in a wide range of audiovisual practices such as video remix, collage films, etc.

Gabba:
Gabba is a sub-category of electronic music that is characterised by the incorporation of noise elements.

Gaudreault and Marion's model of the genealogy of media describes the development of a medium from a technological invention (2002). It comprises three different stages:

1) Irruption:

In Gaudreault and Marion's model, irruption refers to the invention and subsequent cultural emergence of a technological invention.

2) Monstration:

Monstration is the second phase of the development of a medium from a technological invention. It follows the irruption of a technology, and is marked by two concurrent tendencies where the new technology is largely used to reproduce the established conventions of a prior medium, while its medium specific potential begins to be explored.

3) Autonomy:

Autonomy coincides with an institutional recognition of a particular media arts practice and a decisive improvement in the economic resources devoted to its production. It is articulated in: its media specific means of transmission and the technological possibilities of this means; the ways in which it is disseminated; its semiotic configuration; and, the communicative and relational devices to which all of these features contribute.

Hand-held shot:
Hand-held shooting is a technique of audiovisual production in which a camera is held in the camera operator's hands, rather than being mounted on a tripod or pedestal.

Human-readable format:
Human-readable format is the representation of digital data in a form that can be naturally read by human beings.

I/O error:
Input/output (I/O) is the means by which a computer exchanges information with peripheral devices, for example, input devices such as the keyboard or the mouse, or output devices such as the display or the printer. Computer networking is a form of I/O.

Industrial music:
Industrial music is an experimental style of music that incorporates industrial sounds to produce sonically transgressive compositions.

Information superhighway:
In the 1990s the term 'information superhighway' was used to refer to digital communication systems and the Internet.
intermedia:

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Fluxus artist Dick Higgins (1966) employed the term intermedia to describe the inter-disciplinary practices between genres of art and creativity that emerged in the 1960s.

Internet meme:
An Internet meme is an activity, concept, catchphrase or piece of media which spreads from person to person/user to user via the Internet.

Instagram:
Instagram is an online photo- and video-sharing service that enables its users to apply digital filters to their photographs and videos and share them through social networking services.

Intonarumori:
Intonarumori are noise generators designed and built by the Futurist artist Luigi Russolo that enabled him to control the dynamics and pitch of the noises produced.

iTunes:
iTunes is a media player library application developed by Apple.

Jump cuts:
A jump cut is a type of audiovisual editing technique in which two sequential shots of the same subject are taken from camera positions that vary only slightly in orientation or focal length.

Lens flare:
A lens flare is created when non-image forming light enters the lens of the camera and subsequently hits the photographic film (analogue photography), or its digital sensor (digital photography).

Loading screen:
A loading screen is the image shown by a computer programme that indicates that the programme or file is loading or initialising.

Lossy data compression:
Lossy data compression is a means of reducing the size of a media file by discarding some of its data in order to accommodate the bit rate of the desired media-streaming platform. The compression of an image can result in visible pixellation, or compression artefacts.

Machinima:
Machinima is the use of real-time computer graphics engines for audiovisual production. Typically, video games and online virtual worlds, such as *Second Life*, are used to generate the computer animation.

Metacinema:
The term 'metacinema' refers to the use of a range of filmic techniques whereby the story of the making of the film is incorporated into the film's narrative.

Metafiction:
The term 'metafiction' refers to a range of literary devices that parody or depart from novelistic convention in order to self-consciously and systematically draw attention to the literary work as artefact.

Mise en abyme:
Mise en abyme is a formal technique in Western visual arts in which an image contains a smaller copy of itself, which contains a smaller image of itself, and so on, where the sequence appears to infinitely recur. It has other related implications throughout the arts: in literature – a play within a play, for example, and in film – a dream within a dream, for example.

Mise-en-scène:
Mise-en-scène is a term derived from theatre practice, which refers to the setting of all of the stage elements. It endures in audiovisuality where it denotes the setting of all of the on-screen elements.

Narrative:
The term narrative - as I use it throughout this thesis - does not refer, as it tends to be used in film studies, to conventional film narrative, elsewhere termed classic Hollywood narrative. Rather, I use it to refer to storytelling in its general sense, as in literary or musical narrative.

Noise:
In communication theory noise comprises artefacts of error, or, that which would have customarily been considered extraneous to effective communication.
See: Claude E. Shannon, 'A Mathematical Theory of Communication' (1948); Claude E. Shannon, and Warren Weaver, *The Mathematical Theory of Communication* (1971); Rosa Menkman, *Network Notebooks 04: The Glitch Moment(um)* (2011).

Noise music:
The musical sub-category of noise music comprises the deliberate introduction of noise to a musical context.

Noosphere:
Pierre Teilhard de Chardin's concept of the noosphere described a theoretical sphere of human thought that envelops the globe (1955).

On location:
'On location' is a term used in audiovisual practice in order to distinguish field recording, or that which *is not* shot in a studio, from that which *is* shot in a studio.

Overexposure:
Overexposure is a term applied to lens based practices to describe an image that has a loss of highlight detail, when the bright parts of an image are exaggerated so that they become completely white, or overexposed.

Panning shot:
Panning is a camera movement whereby the camera rotates, following a horizontal trajectory, on the central axis of a tripod or pedestal.

Particle burst:
A particle burst is a visual effect that is typically digitally generated using post-production software, whereby an image assembles or disassembles from a multiplicity of coloured particles.

Playhead:
A playhead is a graphic line or button in the timeline that represents the position, or frame, of the audio or audiovisual material that is currently being accessed.

Pinterest:
Pinterest is a pin board-style photo-sharing website that allows users to create and manage theme-based image collections.

Point-of-view shot:
A point of view shot (also termed subjective camera) is a type of camera shot typical in audiovisuality whereby the camera allows the viewer to see from the point of view of an on-screen character.

Profilmic:
That which is located (props), or occurs (action), in front of the film camera.

Progress bar:
A progress bar is a component of a graphical user interface used to visualise the progression of an extended computer operation, such as in the case of *YouTube*, a video download.

Random access:
Random access, as opposed to sequential access, is a term in computer science that describes the ability to access an item of data at any given coordinates in a population of addressable elements.

Shot Reverse Shot:
Shot reverse shot is a convention of audiovisuality whereby two shots are edited together in order to allow the viewer to see a character and to see what that character is looking at.

Shutter speed:
Shutter speed is a photography term that refers to the length of time that a camera's shutter is open when taking a photograph.

Signal corruption:
Signal corruption refers to the failure of a communication channel to produce an exact reconstruction of a signal.

Single take:
A single take in media production, particularly audiovisuality, is an instance of a continuous recording or shooting of a scene.

Sonification:
To convey information or perceptualise data through the use of non-speech audio. For further information see: Gregory Kramer, 'Auditory Display: Sonification, Audification, and Auditory Interfaces' (1994).

Spinning wait cursor:
'Spinning wait cursor' is the official term for the rainbow wheel that the pointer in Apple's Mac OS X (Operating System 10), for example, turns into when an application is not responding to system events.

System bug:
A system bug is a coding error in a computer programme.

System crashes:
A system crash occurs when a computer or a programme fails to function correctly.

Test card:
Test cards are the once physical, now largely virtual, test patterns that are used for calibrating or troubleshooting audiovisual equipment for optimal functionality.

The 180° rule:
The 180° rule governs the on-screen spatial relationship between a character and another character or an object within a scene, for example.

Thumbnails:
Thumbnails are reduced-size images that appear on a media-streaming interface. They are derived from video files, for example, and are used in order to more

efficiently visually organise, and thus, access the original files that they denote and are hyperlinked to. Thumbnails also feature in visual search engines, in image-organising programmes and in most operating systems or desktop environments.

Tumblr:
Tumblr is a microblogging platform and social networking website that allows users to post multimedia and other content to a short-form blog.

Twitter:
Twitter is an online social networking and microblogging service where users can send and read text-based messages limited to 140 characters.

User experience (UX):
The concept 'user experience' comprises the practical, experiential, meaningful and affective features of human–computer interaction.

Vidding:
Vidding is a fan labour practice - a creative activity engaged in by fans - of creating music videos from one or more media sources, thereby reinterpreting the themes, icons, narratives, characters, etc. of the source material.

Video clip:
A video clip is a very short duration video. The popularity and production of video clips has increased in line with the development and democratisation of media production tools and technologies and distribution platforms, such as *YouTube*.

Viral video:
A viral video is a digital video that is shared amongst Internet users on a large scale, typically through video sharing websites, social media and email. A video is considered viral in terms of the large number of views or hits it receives at any one site on which it is streamed.

VJing:
VJing is the live production of visuals, typically to accompany electronic music performance (DJing).

Whip pans and tilts:
Whip pans or tilts are in-camera visual techniques whereby the camera moves very rapidly following a horizontal or vertical trajectory.

Wi-Fi:
Wi-Fi is a wireless networking technology that uses radio waves to provide wireless high-speed Internet and network connections.

3D (three-dimensional) computer graphics rendering engines:
3D computer graphics rendering engines automatically convert 3D digital models into 2D images with photorealistic or non-photorealistic effects.

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