

# An impossible present : the indivisible time of video feedback art

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# **AN IMPOSSIBLE PRESENT: THE INDIVISIBLE TIME OF VIDEO FEEDBACK ART**

by  
**JUSTIN HARVEY**

A thesis in fulfillment of the requirements for the degree of Doctor of Philosophy

Faculty of Art & Design

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**Abstract:**

An Impossible Present: The Indivisible Time of Video Feedback Art is a practice-based research project that investigates the capacity of artists to impact our understanding of the thing around which much of our conscious experience is structured yet which cannot be grasped: time. It consists of the iterative creation of four artworks along with a written thesis examining historic and contemporary artistic practices, including my own, that employ video feedback. I interrogate artists' conceptual preoccupations, the processes they use and their aesthetic outcomes using novel applications of philosopher Henri Bergson's philosophy of consciousness and time to provide new understandings of their work. Bergson argues that conscious existence can be understood as the indivisible continuity of change, which he calls duration, and yet we divide all things as a means of control over the material world, including time. I argue that specific artworks that utilise video feedback provoke a certain way of thinking about, or indeed experiencing time contrary to the usual way that video is used to divide it.

Throughout the thesis I make use of three interpretations of Bergson's philosophy, media theorist Mark B. N. Hansen's reformulation of Bergson's thinking to account for digital video technology, transdisciplinary critical philosopher David Kreps' alignment of Bergson's theory of evolution with developments in evolutionary biology, and philosopher Michel Serres' extension of Bergson's theory of time as indivisible to an understanding of time as manifold. Each interpretation is brought into relation with one of the artworks I produced as part of this research along with the artworks of others who engage with consciousness and time in their use of video feedback. In the hands of the artists discussed throughout this thesis, the video feedback loop becomes a metaphor for human consciousness and through the shaping of these loops, they create artworks that move toward restoring the quality of indivisibility to the concept, and indeed experience, of time.

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## Table of Contents

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Acknowledgements		viii
Documentation		ix
List of Figures		x
Introduction	From Glitch to Video Feedback	1
0.1	A Timely Proposition	5
0.2	Feedback in Video Art	6
0.3	The Time of Henri Bergson — Duration	10
0.4	The Feedback Suite	16
Chapter 1	Eye of the Beholder: Video Feedback and Expanded Consciousness	20
1.1	A New Medium	20
1.2	Communication and Control: Against Blind Progress	22
1.3	The Medium and The Message: Toward A Higher Power	26
1.4	Radical Software and Expanded Cinema: Calls to Artistic Action	30
1.5	Video Feedback: An Uncanny Mirror	32
1.6	Creative Consciousness: Under the Influence of Video Feedback	36
1.7	Eye of the Beholder: Perception of Perception	45
Chapter 2	The Glitch, The Cut and The Curtain	52
2.1	The Rise of Digital Media	52
2.2	Bergson for the Digital Age	55
2.3	The Aesthetics of Failure	58
2.4	Feedback in Glitch Art	62
2.5	Datamoshing: Muddying the Hard Cut of Video	66
2.6	Curtain: An Impossible Present	73
Chapter 3	Emergent: Strange Video Loops of Consciousness	80
3.1	Emergent: Live Video Feedback	81
3.2	Bergson’s Original Impetus — Time	83
3.3	Emergence vs Creation	88
3.4	The Strange Loop of Consciousness	93
Chapter 4	Saturn Return: Multitudes of Time	101
4.1	Serres and Bergson: Knowledge and Time	101
4.2	Multitudes of Time	105
4.3	Chaos Reigns: <i>Dream’sdreams</i>	108
4.4	Saturn Return: Scales of Time	112
Postscript		120
Bibliography		127



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## **Documentation**

This thesis is accompanied by a website that provides images and video documentation of each artwork produced as part of this research, exhibited together as *The Feedback Suite* in August 2020. The site includes a short video walkthrough of the exhibition, a 360° video of the show and individual documentation of each work along with source files. It is essential when reading each chapter that the respective work is viewed as it is discussed in the thesis.

Please visit: <https://www.animpossiblepresent.com/>

Where the works of other artists are discussed I have provided in-text images.

## List of Figures

**Figure 1** Philip Galanter, *Untitled (Cables) V072739A* (1993).

**Figure 2** Dan Graham, *Present Continuous Past(s)* (1974), artist's sketch.

**Figure 3** David Hall, *Progressive Recession* (1975), installation view.

**Figure 4** Eric Siegel, *Psychedelelevision* (1968-1969).

**Figure 5** Peter Donebauer, *Teeming* (1975).

**Figure 6** Justin Harvey, *Eye of the Beholder* (2015).

**Figure 7** Justin Harvey, *Eye of the Beholder* (2015).

**Figure 8** Justin Harvey, *Eye of the Beholder* (2015).

**Figure 9** Rosa Menkman, *Radio Dada* (2009).

**Figure 10** Rosa Menkman, *The Collapse of PAL* (2010).

**Figure 11** Douglas Goodwin and Rebecca Baron, *Lossless #2* (2008).

**Figure 12** Connor McGarrigle, *Mad Men: the BitTorrent Edition* (2011).

**Figure 13** Justin Harvey, *Curtain source image* (2016).

**Figure 14** Marc Fichou, *The Artist* (2016), installation view.

**Figure 15** Marc Fichou, *Panel close up: Time Field* (2014).

**Figure 16** Barbara Doser and Hofstetter Kurt, *Dream'sdreams* (2011).

**Figure 17** Justin Harvey, *Saturn Return* (2019).

**Figure 18** Maurice Benayoun, Tobias Klein and Nicolás Mendoza, *Value of Values* (2019), installation view.

**Figure 19** Louis-Philippe Rondeau's *Liminal* (2018), installation view.

## INTRODUCTION

### From Glitch to Video Feedback

In 2015 I travelled to Vancouver in Canada to exhibit my artwork *I Sit Inside You Crying/Glitch Monument* (2015) at the 21<sup>st</sup> International Symposium on Electronic Art (ISEA). I had just embarked upon my doctoral candidacy and had situated my art practice firmly within the field of ‘glitch’, one of the sub-themes of ISEA that year. Broadly speaking, glitch art entails the aestheticisation of unexpected malfunctions or forced errors in digital sound and imaging technologies, and at that time I had been glitching still and moving images for several years. I had been predominantly using the camera and associated applications on my smartphone to create glitch art, misusing panoramic software to capture ‘impossible’ images in camera and remixing captures of unexpected glitches when digital imaging software failed to fail completely. The artistic outcomes presented glitchy, warped versions of what I considered my increasingly digitally mediated reality.

For me, glitches represent not only disruptions of digital flows of data but interruptions to the increasing speed of life that digital media enable. *I Sit Inside You Crying/Glitch Monument* was intended as a memorial for the glitch art genre that had developed from a fringe set of experimental practices in the late 1990s into a burgeoning field of art practice in the 2000s, with broad aims of highlighting and critiquing the background processes that comprise digital media technologies.<sup>1</sup> My early research had centred around questions concerning the ongoing potential for glitch art to critique visual culture in a context where smartphones were becoming a prominent device with

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<sup>1</sup> *I Sit Inside You Crying/Glitch Monument* was constructed using video screen captures of glitching digital objects in 3D video imaging software on my smartphone. By zooming into the moving preset 3D objects, I forced the software beyond the limits of its resolution, resulting in a failure of the software to completely render certain panels of the object. The result is a single-channel video for large-scale projection of glitching 3D structures, their red and black lined surfaces crackling and distorting as they rock slowly back and forth.

which to create and consume video. My attendance at ISEA in 2015, however, marked a turning point in the trajectory of my research.

Artist, theorist and co-curator of *ISEA 2015: Disruption*, Malcolm Levy, broadly likened the art on display with electronic art that was being created in the 1960s, whereby artists used emergent technologies as “a way of disrupting earlier categories of artistic practice.”<sup>2</sup> It was during the 1960s that artists began experimenting with newly available video technology to create artworks that would come to be classified under the umbrella term *video art*. Artist and theorist Stephen Jones claims that video art has always engaged in two activities: “the deconstruction of the role of television in the setting of meanings and agendas in daily life,” and “the redevelopment of the visual image in areas where we had hardly been able to look before, that is, the manipulated or synthetic image.”<sup>3</sup> Where the first category includes video work that more or less involves the replaying of pre-recorded, reordered and sometimes distorted representations of the world, the second entails installations wherein “the video system itself becomes an object of art.”<sup>4</sup> It is this category into which many of the artworks at ISEA that year could be grouped, in as much as they eschewed representation in favour of the various abstract affordances of video, often synthesised in combination with other digital systems.<sup>5</sup> In fact, Levy encouraged viewers at ISEA 2015 to consider “the entire exhibition as a conversation around synthesis,” referring to the machines used by artists, both analogue and digital, as “instruments... as mediums unto themselves.”<sup>6</sup>

One work in particular that drew my attention was artist and theorist Philip Galanter’s *Untitled (Cables) V072739A* (1993), which had been generated using only analogue video feedback, a system wherein a video camera is directed at a screen displaying its own output so that the output of the camera is fed immediately back to

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<sup>2</sup> Malcolm Levy, “Introduction,” in *ISEA 2015: Disruption Artistic Program*, ed. Kate Armstrong (Vancouver: New Forms Art Press, 2015), 18.

<sup>3</sup> Stephen Jones, *Synthetics: Aspects of Art and Technology in Australia, 1956–1975* (Cambridge, MA: MIT Press, 2011), 211.

<sup>4</sup> Jones, 211.

<sup>5</sup> Justin Lincoln’s *The Stroboscope (For Paul Sharits)* (2014), is one such example, for which images taken from microblogging website Tumblr were used to generate colours that were then manipulated using Processing, a digital coding language, to create a flickering series of still and moving images of thin vertical multicoloured lines.

<sup>6</sup> Levy, “Introduction,” 18.

itself without any further intervention, creating a recursive video loop. Galanter's use of analogue video feedback seemed anachronistic among so many artworks that were made using some form of digital technology, yet it spoke to the history of synthesis to which Levy referred. Jones describes video feedback as the most basic type of image synthesis, a generative form, "a sort of abstract expressionism gone mobile and fluid, waves of colour and echoes of shapes and objects slewing across the screen forming shapes that refer to nothing in the world."<sup>7</sup> With no worldly referents to be seen in *Untitled (Cables) V072739A*, the visual outcomes are open to metaphorical interpretations not available in video art that records and represents objects and events in the world. *Untitled (Cables) V072739A* presents a screen full of shimmering vertical coloured lines that appear almost three dimensional, pulsing and changing colour in a slow rhythm as light washes across the frame. (fig. 1) The colours change from greens and blues to yellows and reds with each wash of light to mesmerising effect, making it impossible to locate a present moment within the work. With no figurative representations of its measurement and passing, and no edit points to demarcate one moment from the next, I became lost to any objective sense of time. As Jones points out, video is "first and foremost a time-based art: an art that takes place in time," but "where the feedback cycle is irrelevant to the work, then it returns to the cinematic (and illusionistic) role to which much contemporary video art has tended, becoming simply a presentation of some prestructured narrative."<sup>8</sup> Far from a prestructured narrative, *Untitled (Cables) V072739A* was instead an invitation to dwell within the rhythms created using feedback, providing an opportunity to reflect on the meaning of those rhythms: literal, metaphorical or otherwise. As a result of this experience my research interest was diverted away from disrupting the flow of data that comprises digital video and toward disrupting notions of time.<sup>9</sup>

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<sup>7</sup> Jones, *Synthetics*, 211.

<sup>8</sup> Jones, 207.

<sup>9</sup> That is not to say that this thesis elides a discussion of glitch art altogether, in fact chapter two is dedicated to elucidating glitch practices that involve forms of feedback.

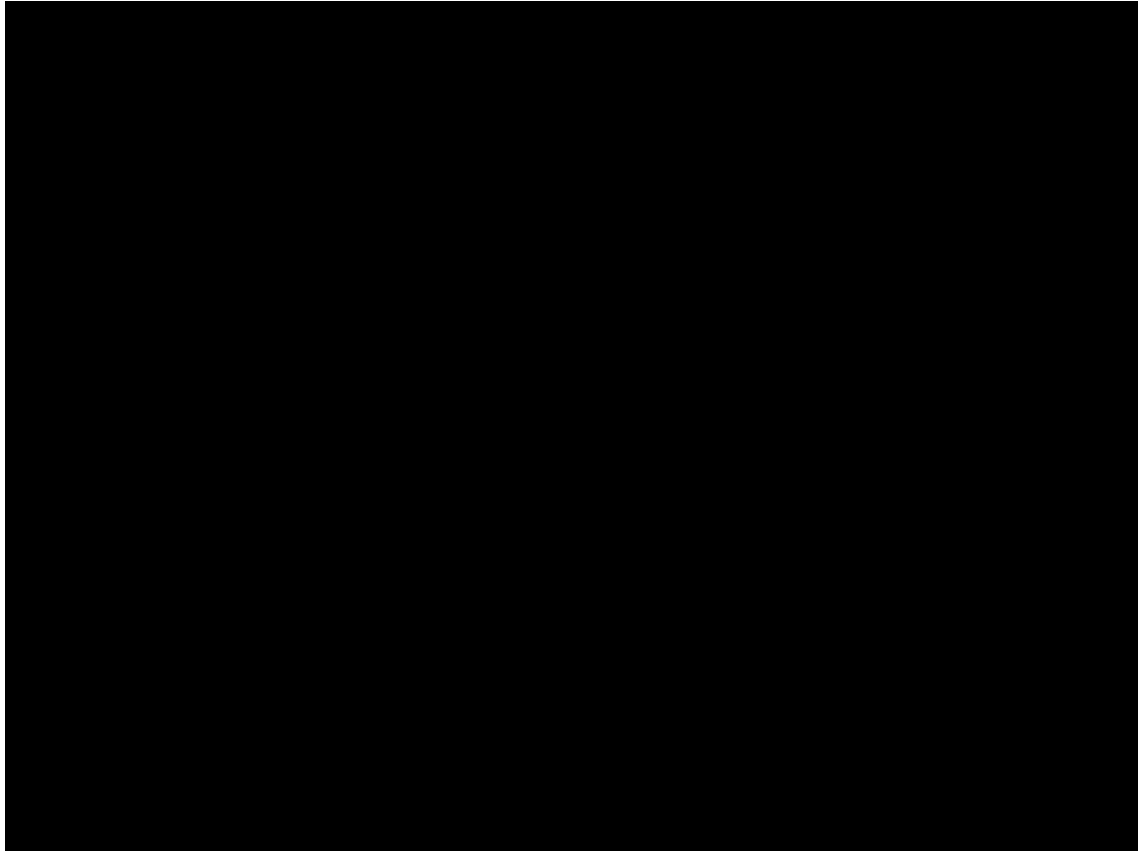


Figure 1: Philip Galanter, *Untitled (Cables) V072739A* (1993), video still of online documentation, <http://philipgalanter.com/art/genanalog/cables>.

Rather than using my smartphone camera to glitch segments of pre-recorded time, I started using it as an instrument to loop time back on itself, performing a series of artistic experiments with digital video feedback. These experiments prompted a process of concurrent practical and theoretical investigations into the artistic potentials for video feedback to provoke an idea or indeed experience of time differentiated from the idea of time that video normally represents; as recordable, repeatable and divisible. What kind of images might I be able to synthesise with digital video feedback? How might I shape these synthesised images to draw someone into a particular experience of time? How have other artists used video feedback to explore ideas of consciousness and time in contrast to the way video usually segments and reorders it?



## 0.1 A Timely Proposition

This practice-based research project is entitled *An Impossible Present* and consists of the iterative creation of four artworks — *Eye of the Beholder*, *Curtain*, *Emergent* and *Saturn Return* — along with a written thesis examining historic and contemporary artistic practices, including my own, that employ video feedback. I interrogate these artists' conceptual preoccupations, the processes they use and their aesthetic outcomes using novel applications of philosopher Henri Bergson's philosophy of consciousness and time to provide new understandings of their work. Bergson drew from the physical sciences, psychological and evolutionary theories of the late nineteenth and early twentieth century to inform his particular style of metaphysics. He considers the conscious experience of time as paramount to all intellectual efforts to measure it objectively and that only through dwelling in duration — the continuous multiplicity of conscious experience — do we gain authentic knowledge about ourselves and the world around us. Throughout the thesis I make use of three interpretations of Bergson's philosophy: media theorist Mark B. N. Hansen's reformulation of Bergson's thinking to account for digital video technology, transdisciplinary critical philosopher David Kreps' alignment of Bergson's theory of evolution with developments in evolutionary biology, and philosopher Michel Serres' extension of Bergson's theory of time as indivisible to an understanding of time as manifold. Each interpretation is brought into relation with one of the artworks I produced as part of this research, along with the artworks of others to answer my central question: *How do the processes used and aesthetic experiences produced by artists engaging with ideas of consciousness through video feedback explicate philosophical notions of time?*

The remainder of this introduction is dedicated to providing a framework to approach the body of the thesis. Firstly, I provide preliminary definitions of my use of two key terms: *video feedback* and *time*. These definitions should be considered as points of departure, as part of the work of this thesis involves refining them through the analysis of artistic practices that involve the shaping of video feedback, the cultural contexts in which they have manifested and the aforementioned interpretations of Henri Bergson's philosophical understanding of the conscious experience of time. I then

provide an overview of the artworks I produced as part of this research project and outline the contents of each chapter.

## 0.2 Feedback in Video Art

Feedback can be considered as a fundamental affordance of video technology. Video cameras convert light into an electronic signal or a digital stream of data that can be sent to a video monitor, where the signal or data stream is converted back into the image captured by the camera. The video image can thereby be viewed immediately or preserved for review at any time in the future. In this way video technology is capable of providing instantaneous playback, allowing artists to see and hear themselves, the world and each other in real time, the ever-passing present. By turning the camera on itself, a video feedback loop is instantiated. A far from exhaustive list of artists who have used video feedback in their work includes Nam June Paik, Eric Siegel, Peter Donebauer, Bill Viola, Joan Jonas, Stephen Jones, Gary Hill, Takahiko Iimura, Steina Vasulka, Woody Vasulka, Stephen Partridge, Peter Weibel, Les Levine, Peter Campus, Dan Graham, David Hall, Bruce Nauman, Skip Sweeney, Wojciech Brzuszewski, Joanne Kyger, Lynda Benglis, Brian Hoey, Jonathan Brainin, Marc Fichou, Masayuki Kawai and Philip Galanter. Iconic artworks incorporating live, unprocessed closed-circuit video feedback, such as Paik's *TV Buddhas* (1975–2002), will not be dealt with in this thesis because the feedback in these works is not manipulated or shaped in any way. Rather, I am interested in the artistic use of three specific forms of video feedback that I am coining *direct feedback*, *indirect feedback* and *extended feedback*.

A direct video feedback loop is created when a video camera is directed at a screen displaying its output so that the output of the camera is fed immediately back to itself without any further intervention. Artworks created using direct video feedback include Philip Galanter's *Untitled (Cables) V072739A*, discussed above, and Jonathan Brainin's *Pendulum Video* (2013). Indirect video feedback refers to a system where an output signal is processed in some way before it is input back into the feedback loop or when one or more signals are fed into a single output channel. Artworks featuring the

use of indirect video feedback include Steina Vasulka's *Distant Activities* (1972) and Stephen Beck's *Video Weavings* (1976). Extended video feedback refers to a system where there is a deliberate and extended time delay created between the output of a camera and its input back into the loop. Artworks that incorporate extended video feedback, such as Brian Hoey's *Videvent* (1976) and Bruce Nauman's *Live-Taped Video Corridor* (1970), most often include viewers in the feedback loop. I deal with extended video feedback in detail in the following chapter, but now I turn toward a more in-depth explanation of direct and indirect video feedback.

As stated, a direct feedback loop is produced by turning a video camera toward its own output on a monitor whereby that output becomes the video input. This results in the formation of an infinitely recursive image due to the microsecond delays between each successive capture of the image by the camera and its display on the screen.<sup>10</sup> This series of temporal disturbances propagate through the closed system, causing the image to replicate itself indefinitely in the void of the screen.<sup>11</sup> The effects of a video feedback loop are variant, depending on both optical and electronic or digital control parameters.<sup>12</sup> Optical controls include parameters such as zoom, focus, exposure and rotation. Electronic and digital controls include camera settings such as the sensitivity of the camera to light and monitor controls such as brightness, contrast, colour and hue. Examples of the use of direct feedback outside of video include the audio feedback loops between microphones and speakers in Steve Reich's *Pendulum Music* (1968) and the guitar feedback of Lou Reed on his album *Metal Machine Music* (1975).

Direct video feedback is most often discussed within the context of video art histories and scholarly discourses around its use, which rarely intersect with philosophical concerns.<sup>13</sup> Lucinda Furlong describes how in the 1960s and 1970s artists'

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<sup>10</sup> The initial mise en abyme effect of direct video feedback is like that experienced when standing between two interfacing mirrors and looking into one of them to see infinite reflections of yourself trailing into the illusory distance created by the endlessly rebounding light.

<sup>11</sup> In theory this recursion is infinite but in actuality is limited to the smallest available unit of representation, which in the case of modern digital monitors is the pixel.

<sup>12</sup> James P. Crutchfield, "Space-Time Dynamics in Video Feedback," *Physica* 10D (1984): 229–245.

<sup>13</sup> A well-known exception is Rosalind Krauss, "Video: The Aesthetics of Narcissism," *October* 1 (1976): 50–64, where Krauss draw parallels between the artistic use of video and the psychological condition of narcissism.

interest in video synthesis (or video processing as it is also known) was connected to “the modernist credo of exploring the basic properties of the medium.”<sup>14</sup> Direct video feedback, as the most basic form of image synthesis, had begun to be used by artists just as “the whole idea of a modernist practice was being dismantled,”<sup>15</sup> and consequently fell out of favour in art circles beyond a dedicated few. Artist and theorist Chris Meigh-Andrews relegates direct video feedback to the status of a visual cliché, describing the ease with which it could create an ongoing source of synthetic imagery as ultimately a drawback and how the technique quickly became redundant.<sup>16</sup> Both Furlong and Meigh-Andrews cite critic Robert Pincus-Witten’s comments in 1974 on a panel at Open Circuits, the first international video conference held at the Museum of Modern Art in New York, where he dismisses direct video feedback as having little value beyond acting as a catalyst for the development of more sophisticated video synthesisers.<sup>17</sup>

Indirect video feedback is most often the result of a video synthesizer being used to process one or more video signals involved in a feedback loop. Several artists including Paik, Siegel, Beck, Donebauer and the Vasulkas, collaborated with engineers to build video synthesizers that enabled the creation and manipulation of video signals without the use of a camera, effectively expanding the range of control parameters with which to manipulate a video signal in an indirect video feedback loop.<sup>18</sup> Today, software applications such as Processing and Max MSP are commonly used to build software-based digital video synthesizers. My aim here, however, is not to provide an exhaustive account of the ways in which artists used indirect video feedback, nor to elaborate on the technical advances in video synthesis that many of them were instrumental in achieving; that work has been done in detail by others.<sup>19</sup> Rather, my contribution is to

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<sup>14</sup> Lucinda Furlong, “Tracking Video Art: Image Processing as a Genre,” *Art Journal* 45, no. 3 (1985): 234.

<sup>15</sup> Furlong, 234.

<sup>16</sup> Chris Meigh-Andrews, *A History of Video Art: The Development of Form and Function* (Oxford: Berg, 2006), 234.

<sup>17</sup> Robert Pincus-Witten, “Panel Remarks,” in *The New Television: A Public/Private Art*, ed. Douglas Davis and Allison Simmons (Cambridge, MA: MIT Press, 1977), 69–71.

<sup>18</sup> Chris Meigh-Andrews gives a detailed historical account of the collaborative development of video synthesizers in chapter 7 of his book, *A History of Video Art*.

<sup>19</sup> See Catherine Elwes, *Video Art, A Guided Tour* (London: I.B. Tauris, 2005); Sean Cubitt, *Videography: Video Media as Art and Culture* (London: Macmillan, 1993); Doug Hall and Sally Jo Fifer, eds., *Illuminating Video: An Essential Guide to Video Art* (New York: Aperture/BAVC, 2005); Julia Knight ed., *Diverse Practices: A Critical Reader on British Video Art* (Luton: University of Luton Press, 1996); Yvonne

read the work of certain artists who have used video feedback from the 1960s up to the present through the lens of Henri Bergson's philosophy of time. Throughout this thesis I build an argument for an understanding of direct video feedback in particular as a metaphor for human consciousness.

Art critic Robert Arn, writing in 1973 about the then burgeoning field of video art, claims that with direct video feedback,

we reach the limit of talking about the video image as image. A feedback image is not a picture of anything finally; it is a balance of purely electronic forces below the threshold of perception.<sup>20</sup>

By this Arn means that rather than being a record of things or events in the world, as video most commonly is, direct video feedback instead describes the forces at work within video technology itself. As such, to engage with it artistically is to eschew the potential of video to necessarily represent objective reality and to delve into the capacities of video to act as a metaphor for other unseen forces. In the hands of artists, direct and indirect video feedback can be used to generate forms that evolve to resemble those found in nature, such as microscopic cells dividing, the spiral patterns seen in seashells and galaxies, and waves on the ocean. I advance an argument in detail in chapter three that these kinds of artistically shaped resemblances enable video feedback systems to be read as metaphors for evolutionary processes evidenced in nature and by extension the processes underlying our own conscious perception. Video feedback can also be used to produce images akin to those seen in the mind's eye during meditation practices and hallucinatory states, such as mandalas, thereby becoming an even more potent metaphor for human consciousness. While this metaphor is not overtly apparent in all of the artworks I examine throughout this thesis, each entails a specific relationship to the conscious experience of time. I claim that specific works of art involving video feedback created by Dan Graham, David Hall, Peter Donebauer, Rosa

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Spielmann, *Video: The Reflexive Medium* (Cambridge, MA: MIT Press, 2007); Slavko Kacunko, *Closed Circuit Videoinstallationen* (Berlin: Logos Verlag, 2004).

<sup>20</sup> Robert Arn, "The Form and Sense of Video," in *Artscanada* (Toronto: Society for Art Publications, October 1973), 21.

Menkman, Douglas Goodwin and Rebecca Baron, Connor McGarrigle, Marc Fichou, Barbara Doser and Hofstetter Kurt, and myself contribute towards an understanding of time as conceptualised by Henri Bergson — an indivisible continuous multiplicity.

### 0.3 The Time of Henri Bergson — Duration

To discuss time is to speak of that which we know intimately yet have difficulty defining. We divide time into night and day, hours and minutes, past and future, and yet our experience of it is not necessarily in keeping with these divisions. Within the context of this thesis I am interested in our conscious experience of time as understood by Henri Bergson, whose ideas continue to resonate today, more than a century after he first began espousing them. In *Time and Free Will: An Essay on the Immediate Data of Consciousness* (1889), Bergson advances his theory of duration: the understanding of consciously experienced time as a heterogeneous, continuous and qualitative multiplicity. He argues that it is due to our overidentification with discrete objects and events, or simultaneities, that exist and occur in the homogenous space outside of ourselves, that we are led to believe our conscious states are equally discrete and divisible.<sup>21</sup> This results in a tendency toward mechanistic thinking and habitual action that elides our capacity for novel thought, consequently undermining our creative potential.<sup>22</sup> Bergson's argument aligns with the contemporaneous movement in scientific thought away from Newtonian physics, in which time was considered a constant much like space, both reversible and divisible, toward Einstein's theory of relativity, in which the measurement of time was considered relative to a particular point of view. This is not to say Bergson agrees with Einstein on the nature of time; in fact he disputes Einstein in painstaking detail some years later in *Duration and Simultaneity: With Reference to Einstein's Theory* (1922), arguing that a theory premised on time's measurement could never accurately represent the more fundamental

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<sup>21</sup> Henri Bergson, *Time and Free Will: An Essay on the Immediate Data of Consciousness*, trans. F. L. Pogson (London: George Allen & Co., 1913; New York: Dover, 2001), 108. Citations refer to the Dover edition.

<sup>22</sup> Bergson, 169.

conscious experience of time. For Bergson, the problem is that time has been confused with space.<sup>23</sup>

Bergson argues that space is the medium in which we necessarily conceive of numbers in our minds — in other words, we understand that the existence of two or more of anything must necessarily mean that they are juxtaposed in space.<sup>24</sup> This is so simply because two things can not share the same space: the chair stands *beside* the table, *near* the door. Of course, a collection of objects in space can be thought of as a unity in itself, such as a bag of rice grains, which is also divisible into the single units that make up the whole bag. Bergson describes objects in space as discrete multiplicities but maintains that our conscious states do not share the same character. The reason for this is that “a moment of time... cannot persist in order to be added to others.”<sup>25</sup> In fact, according to Bergson,

there are two kinds of multiplicity: that of material objects, to which the conception of number is applicable; and the multiplicity of states of consciousness, which cannot be regarded as numerical without the help of some numerical representation, in which a necessary element is *space*.<sup>26</sup>

Space, for Bergson, entails the conception of “an empty homogenous medium.”<sup>27</sup> He suggests that our idea of space as homogenous is bound up with our perception of extensity, conceived as “a kind of reaction against the heterogeneity which is the very ground of our experience.”<sup>28</sup> By conceiving of space in this way, we are able to define and count discrete objects, to abstract things from their place in space and even to create languages with which to describe them. By doing so we are able to gain control over our environment, ultimately enabling our survival in a world beset with contingencies. But our conscious experience of time is nothing like the homogenous space of which we have conceived and made use. On the contrary, Bergson describes our conscious

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<sup>23</sup> Bergson, 191.

<sup>24</sup> Bergson, 85.

<sup>25</sup> Bergson, 87.

<sup>26</sup> Bergson, 87 (emphasis in original).

<sup>27</sup> Bergson, 95.

<sup>28</sup> Bergson, 97.

experience of time as, “a succession of qualitative changes, which melt into and permeate one another, without precise outlines, without any tendency to externalise themselves in relation to one another, without any affiliation with number.”<sup>29</sup> This, for Bergson, is pure duration.

Bergson argues that the reason we have trouble thinking about time in its actual sense as duration, as continuous multiplicity or qualitative heterogeneity, is that “we do not *endure* alone.”<sup>30</sup> The material objects that surround us seem to endure as we do and we mistake our counting of discrete simultaneities with the continuous “interpenetration of conscious states.”<sup>31</sup> The reason we continue to identify our subjective states with the objective world is that it is extremely useful to our survival in contemporary life to nurture this clarity of mind. In short, we gain control over our circumstances through intellectual analysis and our actions are based on the conclusions that result from this analysis. But the more we identify our conscious states as distinct from one another, the further away we get from our true selves. Consequently, as Bergson puts it, “a second self is formed which obscures the first, a self whose existence is made up of distinct moments, whose states are separated from one another and easily expressed in words.”<sup>32</sup> While there are obvious advantages to nurturing this second self, there are attendant perils inherent in equating our states of mind with distinct objects in space. Bergson suggests it leads to mechanistic, even deterministic thinking and consequential acting in the world, where our habitual responses undermine the potential for novel and creative conscious action.

The problem, according to Bergson, is that “our daily actions are called forth not so much by our feelings themselves, which are constantly changing, as much by the unchanging images with which these feelings are bound up.”<sup>33</sup> So rather than allowing our perceptions of images in the world around us to penetrate the fullness of our consciousness, they trigger a conditioned response whereby we act more like “a

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<sup>29</sup> Bergson, 104.

<sup>30</sup> Bergson, 107 (emphasis in original).

<sup>31</sup> Bergson, 108.

<sup>32</sup> Bergson, 138.

<sup>33</sup> Bergson, 167–168.



conscious automaton”<sup>34</sup> than a human being exercising free will. Bergson maintains that even when we rebel against our conditioned responses we are likely to try to attribute the rebellion to a circumstance directly preceding it rather than accepting that it is actually the result of a slow-burning process of densely intermingled feelings, reactions and counter-reactions that have been either unconsciously or consciously, rigorously, suppressed. Bergson sums up as follows:

There are finally two different selves, one of which is, as it were, the external projection of the other, its spatial and, so to speak, social representation. We reach the former by deep introspection, which leads us to grasp our inner states as living things, constantly *becoming*, as states not amenable to measure, which permeate one another and of which the succession in duration has nothing in common with juxtaposition in homogeneous space. But the moments at which we thus grasp ourselves are rare, and that is just to say why we are rarely free. The greater part of the time we live outside ourselves, hardly perceiving anything of ourselves but our own ghost, a colourless shadow which pure duration projects into homogeneous space. Hence our life unfolds in space rather than in time; we live for the external world rather than for ourselves; we speak rather than think; we “are acted” rather than act ourselves. To act freely is to recover possession of oneself, and to get back into pure duration.<sup>35</sup>

Freedom, for Bergson is only possible through dwelling in duration, which has nothing in common with space, nor with time as it appears to be partitioned by clocks and timetables, frozen in photographs and replayed with video. But if, as Bergson suggests, we tend to identify our subjective states with the objective world around us, and our experience of the world is increasingly experienced through video, then it follows that we will tend to correlate our subjective states with the divisions of time that video presents. Similar to the way clocks divide time into hours, minutes and seconds, video divides time into sequences, shots and frames. With video, time can be segmented, reconfigured, reordered and replayed *ad infinitum*, reinforcing the sense that time is divisible. The more identified we are with the way video delineates time, the more likely we are to see our own lived experience as equally divisible. To replay video is to be

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<sup>34</sup> Bergson, 168.

<sup>35</sup> Bergson, 231–232 (emphasis in original).

assured that the outcome on the screen will be the same as it was the last time we watched it, but in life outcomes can rarely be that certain. The time of our experience cannot be divided, reordered or replayed except in memory, the recollection of which is necessarily inflected by our intervening experience.

In *Matter and Memory* (1896), Bergson argues that memory cannot be reduced to the material substrate of the human brain, but instead resides in time. He conceives of the world as a collection of images, the body being primary among them: a center of indeterminacy within a seemingly determined universe.<sup>36</sup> Through the constant intermingling of perception and memory, we interpret the images we encounter and adjust our body through decision and movement. This movement in turn changes our perception of the images and so participates in a feedback loop involving perception, memory and action. For Bergson, pure perception is impossible as it is always inflected by memory and vice versa, or as he puts it:

Your perception, however instantaneous, consists then in an incalculable multitude of remembered elements; in truth, every perception is already memory. *Practically, we perceive only the past*, the pure present being the invisible progress of the past gnawing into the future.<sup>37</sup>

From Bergson's perspective the present is not a point in time but rather an action or reaction, a movement that forms part of the feedback loop of conscious experience. Today, more and more of the feedback loop of consciousness consists of input mediated by video. Media theorist Marshall McLuhan, who I discuss at length in the following chapter, states that humankind is "long accustomed to splitting and dividing all things as a means of control."<sup>38</sup> He claims, following Bergson, that clocks help "to create the image of a numerically quantified and mechanically powered universe... Time measured not by the uniqueness of private experience but by abstract uniform units

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<sup>36</sup> Henri Bergson, *Matter and Memory*, trans. Nancy Margaret Paul and W. Scott Palmer (London: George Allen & Co, 1911; New York: Zone Books, 1991), 25. Citations refer to the Zone Books edition.

<sup>37</sup> Bergson, 150 (emphasis in original).

<sup>38</sup> Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge, MA: MIT Press, 1994), 7.

gradually pervades all sense life.”<sup>39</sup> Our experience of video and the ways in which it is used to divide time pervades our sense life in a similar way. Artist and critic David Antin, writing in 1976, explains how television is premised on an idea of time as absolute, regardless of the images that appear on the screen. In his words, time “is television’s only solid, a tangible commodity that is precisely divisible into further and further subdivisible homogenous units,” the smallest of which being the ten-second commercial spot around which Antin claims all of television time was assembled.<sup>40</sup> Today, video continues to divide time as advertisers and self-promoting individuals compete for our attention on social media feeds in the form of short-form video advertisements and looping pop-culture memes. On Instagram, for example, videos posted to rolling stories feeds are automatically divided into fifteen second segments and on Tik Tok video posts are limited to between one and sixty second segments. Facebook’s Business Help Center provides a list of metrics available for video ads that includes divisions of time down to “Cost per 2-second Continuous Video Play.”<sup>41</sup> Now more than ever video divides time in ways Bergson could barely have imagined.

Artist and theorist Jeremy Gilbert-Rolfe argues that for those of us born from 1980 onwards, “video already contained nature; it was not a fresh look at it but the usual experience of it.”<sup>42</sup> Gilbert-Rolfe refers here to the fact that in recent decades many of us first discovered the world beyond our immediate physical context through video records of events edited together to form narratives that describe and explain it. Gilbert-Rolfe goes so far as to suggest that “nowadays, when thinking of ourselves as part of the world seen from outside and by others who are like us, we think of ourselves as a video image.”<sup>43</sup> Video has certainly become one of the dominant technologies through which we experience the world, with data from Nielsen indicating that in 2018 American adults spend on average almost six hours of each day engaged with video.<sup>44</sup> In Australia,

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<sup>39</sup> McLuhan, 146.

<sup>40</sup> David Antin, “Video: The Distinctive Features of the Medium,” in *Video Culture: A Critical Investigation*, ed. John G. Hanhardt (New York: Video Studies Workshop Press, 1986), 156.

<sup>41</sup> Facebook for Business: Business Help Center, “About Video Ad Metrics,” accessed August 6, 2020, <https://www.facebook.com/business/help/1792720544284355?id=603833089963720>.

<sup>42</sup> Jeremy Gilbert-Rolfe, “Abstract Video,” in *Abstract Video: The Moving Image in Contemporary Art*, ed. Gabrielle Jennings (Berkeley, CA: University of California Press, 2015), 71.

<sup>43</sup> Gilbert-Rolfe, 66.

<sup>44</sup> Nielsen, *The Nielsen Total Audience Report Q1 2018*, 2018, accessed September 18, 2020, <https://www.nielsen.com/wp-content/uploads/sites/3/2019/04/q1-2018-total-audience-report.pdf>.

time spent watching video on smartphones rose from an average of ninety minutes a day to almost three hours a day from 2010 to 2017.<sup>45</sup> So much of our experience of the world is mediated through video it is hardly a stretch to say that for a significant amount of time each day many of us think in and through video. If we think of ourselves as video images, as Gilbert-Rolfe suggests, and we think *in* and *through* video, then it is reasonable to suggest that we perceive our conscious existence as divisible in much the same way that video is.

This is the position from which I proceed to analyse the works of artists, including myself, who engage with consciousness and time in their use of video feedback. Through a combination of their own claims and my interpretations of their practice, I argue that they shape video feedback into more or less abstract video artworks that provoke an authentic experience of time — as indivisible — rather than the segments of lived duration video usually presents. Their artworks do not represent conventional narratives but instead draw viewers into the movement of light that becomes a metaphor for the temporal continuity of lived consciousness.

#### 0.4 The Feedback Suite

My proposition is embedded in the four artworks developed during this doctoral candidature and exhibited together as *The Feedback Suite*. The source material for each work was synthesised using an iPhone 6, an Apple TV and either a MacBook Air or a 42-inch digital television to create digital video feedback loops, which I then shaped using post-production software including Final Cut X, Premiere Pro and After Effects. Each artwork evolved intuitively through experimentation performed in conjunction with historical and theoretical investigations into the way other artists have made use of video feedback to engage with ideas of consciousness and time. The digital video feedback loops used to create the works are dependent upon millions of packets of granularised information being interpreted and transferred over WIFI from camera to

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<sup>45</sup> Nielsen, *Australian Video Viewing Report: Quarter 4 2017*, Regional TAM, OzTAM, 2018, accessed September 18, 2020, <https://www.nielsen.com/wp-content/uploads/sites/3/2019/04/Australian20Video20Viewing20Report20Q4-2017.pdf>.

screen, to be fed back into the image sensor of the camera once again. These packets of information and the loops they travel within the feedback system represent time broken up into innumerable pieces. In each work these pieces are reconstructed into mesmeric video artworks intended to facilitate disengagement from the ordinarily objective notions of time that video usually presents. Each chapter is written around one of the artworks that form part of *The Feedback Suite*, as I bring each into relation with these investigations.

In chapter 1, “Eye of the Beholder: Video Feedback and Expanded Consciousness,” I demonstrate how key aspects of Bergson’s philosophy of consciousness and time punctuate the writing of a series of thinkers who came to influence artists working with video feedback in the 1960s and 1970s. Significant concerns of Bergson’s are reflected in the thinking of Norbert Wiener, whose cybernetic concept of feedback came to influence artists and thinkers alike. Marshall McLuhan takes up Bergson’s ideas of time as well as elements of Wiener’s cybernetics to argue for the potential of electronic technology to catalyse his utopian vision for society and Gene Youngblood extends this vision in *Expanded Cinema*, his treatise on the essential role of artists in utilising technology to expand human consciousness. Each of these thinkers had considerable impact within artist communities, including Raindance Corporation, a collective of artists who began publishing *Radical Software*, a journal dedicated to disseminating information around the potentials for video technology as a tool for social change in opposition to broadcast television. Bergson’s ideas were filtered through this lineage of thinkers who influenced the way artists such as Eric Siegel, Dan Graham and David Hall engaged with ideas of consciousness and time through the use of video feedback. In addition, certain aspects of Eastern philosophy and Jungian psychology impacted on the way artist Peter Donebauer employed video feedback in his work to explore notions of human consciousness and time. I conclude with an analysis of my artwork *Eye of The Beholder* and demonstrate how it reflects the concerns of the artists already discussed in the chapter as well as Bergson’s philosophy of time.

In chapter 2, “The Glitch, the Cut and the Curtain,” I outline the context within which digital postproduction tools came to provide the relatively unbounded control

over the video image long sought after by artists. In the 1990s the evolution of computational logic based on feedback loops presented new avenues of experimentation for practitioners interested in disrupting the video image, leading to the development of glitch art practices and aesthetics. Artists engaging in glitching practices aim to subvert dominant platforms that incorporate digital video including video games, television programs and the codified architecture of the internet. Similar to the way artists in the 1960s and 1970s used feedback to subvert the domination of broadcast television, these artists challenged the accepted narratives and distribution methods of digital video. I point out a gap in scholarship around the use of video feedback in glitch art, extending my definition of video feedback to include glitch practices such as datamoshing. Datamoshing is the process of disrupting the code underlying the instantiation of digital video and I argue that artists including Takeshi Murata, Connor McGarrigle, Douglas Goodwin and Rebecca Baron use datamoshing techniques to muddy the hard cut of video. Taking up Mark Hansen's revisioning of Bergson's philosophy for the digital context, I argue that by muddying the hard cut of video, these artists dispute the possibility of any discernible present moment. Finally, I demonstrate how my artwork *Curtain*, made using a combination of glitch practices, direct video feedback and digital post-production techniques, reflects a Bergsonian notion of time.

In chapter 3, "Emergent: Strange Video Loops of Consciousness," I outline Bergson's theory of evolution, including his concept of the *élan vital*; an original impetus or force that has driven increasing levels of complexity in living beings. Transdisciplinary philosopher David Kreps brings contemporary scientific thought to bear on Bergson's evolutionary theory, drawing on an equivalence between Bergson's concept of *élan vital* and concepts of emergence adhered to in complexity theory. A comparison between philosopher Evan Thompson and cognitive scientist Douglas Hofstadter's approaches to the underlying conditions of consciousness reveals the tensions inherent in philosophical arguments around the way human consciousness emerges through the microprocesses in the human body. In light of these contrasting arguments, I analyse my artwork *Emergent* and Marc Fichou's *The Artist* to demonstrate how the complex patterns that can be produced using video feedback can be understood as a metaphor for human consciousness.

In chapter 4, “Saturn Return: Multitudes of Time,” I begin with an explanation of how philosopher Michel Serres’ complex philosophy of time as multitudinous complements and extends on Bergson’s concept of duration. By rethinking space, Serres is able to reconfigure time for a contemporary context, describing it as cyclical, percolating, and multitudinous. By bringing this understanding of time to bear on two artworks, Barbara Doser and Hofstetter Kurt’s *Dream’sdreams* and my own *Saturn Return*, I demonstrate how they complement both Bergson and Serres’ thinking by drawing the viewer into immersive experiences that reconfigure understandings of time in contrast to those that video normally reinforces.

This is an investigation into the capacity of artists to impact our understanding of the thing around which much of our conscious experience is structured yet which cannot be grasped: time. In concert with *The Feedback Suite*, this thesis analyses the way that artists use video feedback to engage with and represent ideas of consciousness and time through the lens of Henri Bergson’s philosophy. Bergson argues that conscious existence can be understood as the indivisible continuity of change, which he calls duration, and yet we divide all things as a means of control over the material world, including time. I argue that specific artworks that utilise video feedback provoke a certain way of thinking about, or indeed experiencing time contrary to the usual way that video is used to divide it. In the hands of the artists discussed throughout this thesis, the video feedback loop becomes a metaphor for human consciousness and through the shaping of these loops, they create artworks that move toward restoring the quality of indivisibility to the concept, and indeed experience, of time.

## CHAPTER 1

### **Eye of the Beholder: Video Feedback and Expanded Consciousness**

The aim of this chapter is to delineate a tendency for artists to associate video feedback with theories of human consciousness (and concepts of time). I argue that through a succession of thinkers including Norbert Wiener, Marshall McLuhan and Gene Youngblood, key aspects of Henri Bergson's philosophy of time came to influence the way artists worked in the 1960s and 1970s to shape video feedback in their attempts to expand human consciousness. Along with these influences, I show how tenets of Eastern philosophy and Jungian psychology had significant impact on the creative process of specific artists. Dan Graham and David Hall created artwork that invited viewers to become part of video feedback loops in order to provoke an understanding of video as an extension of their consciousness and providing insight into their conscious perception of time. Eric Siegel used synthesised video feedback to produce psychedelic audiovisual experiences that encouraged the exploration of new modes of consciousness. Peter Donebauer shaped video art in collaboration with other artists to create improvised abstract art that aspired to expand the human mind by replicating altered states of consciousness. Finally, I examine my artwork, *Eye of The Beholder*, in light of the preceding discussion, establishing how it reflects the concerns of the artists already discussed, and demonstrating its affinity with Bergson's philosophy of time.

#### 1.1 A New Medium

Video technology became available to the public in 1967 with the release onto the market of the Sony Portapak and artists immediately began to experiment with it, exploiting the qualities of the medium such as live monitoring, continuous recording, simultaneity of sound and image, and feedback, to generate novel and unexpected



artistic outputs.<sup>1</sup> Art critic Marita Sturken argues that the intense focus of artists on the specifics of the medium in the 1960s and 1970s was part of an effort to validate video within the institutions of modern art.<sup>2</sup> In contrast, media art theorist John G. Hanhardt echoes the common claim that “artists working with video in the early 1960s were engaged in a utopian impulse to refashion television.”<sup>3</sup> Others have laid out the voracity and significance of these claims in numerous volumes dedicated to the dizzying array of discourses surrounding these so-called early years of video art.<sup>4</sup> Here I am interested only in two specific concerns of artists at the time: a perceived paucity of value in broadcast television despite the heady potentials inherent in video technology and the related intention of particular artists to expand human consciousness.

By the 1960s, television had become a part of everyday life, with serialised content that was predictable and seen by counterculture activists to lull the populace into a sense of complacency about the troubling events taking place in the world, arguing that it was “immunizing us to the impact of information.”<sup>5</sup> It was a time of significant political upheaval across the globe, with the Vietnam War, the Cold War and the breakdown of Fordism contributing to slowing economies and rising unemployment. As a mass-communication tool, television had the power to send a one-way message into the homes of the population, who had no control over the content or form of the message. In the years leading up to the broadening access to video

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<sup>1</sup> Despite the 1967 release of the Portapak, a story persists in video art histories concerning Nam June Paik making recordings on the streets of New York using the Portapak in 1965 as noted by Chris Meigh-Andrews in *A History of Video Art*, 16. Artists including Paik and Wolf Vostell had been experimenting with video since the early 1960s and many more joined them after the release of the Portapak. A short list includes Vito Acconci, John Baldessari, Jan Dibbets, Richard Serra, Tamara Krikorian, Eric Cameron, Dara Birnbaum, and Martha Rosler.

<sup>2</sup> Sturken points out that as part of the modernist art movement each medium (such as painting or sculpture) was distinguished by its unique properties. She echoes Martha Gerver’s claims that those struggling to validate video as an art medium early on were unable to use the theoretical constructs of painting or film, whilst at the same time needed to demarcate video from commercial/broadcast television. Marita Sturken, “Paradox in the Evolution of an Art Form: Great Expectations and the Making of History,” in *Illuminating Video: An Essential Guide to Video Art*, eds. Doug Hall and Sally Jo Fifer (New York: Aperture/BAVC, 2005), 101–121.

<sup>3</sup> John G. Hanhardt, “Dé-collage/Collage: Notes Toward a Reexamination of the Origins of Video Art,” in *Illuminating Video: An Essential Guide to Video Art*, eds. Doug Hall and Sally Jo Fifer (New York: Aperture/BAVC, 1990), 73.

<sup>4</sup> See Chris Meigh-Andrews, *A History of Video Art*; John G. Hanhardt, ed., *Video Culture: A Critical Investigation*, (New York: Visual Studies Workshop Press, 1986); and Jackie Hatfield and Stephen Littman, eds., *Experimental Film and Video: An Anthology* (Bloomington, IN: Indiana University Press, 2006).

<sup>5</sup> Beryl Korot and Phyllis Gershuny, eds., *Radical Software* 1, no. 1 (1970), inside cover text.

technology, ideas surrounding communication and control in both humans and machines had been making their way into the public consciousness. In particular, concepts born out of the multidisciplinary field of cybernetics had made a significant impact on the way the world thought about the relationship between humans and machines and the consequences of this relationship on human consciousness and the world at large. It is toward a discussion of cybernetics that I will now turn.

## 1.2 Communication and Control: Against Blind Progress

Mathematician and philosopher Norbert Wiener is considered a founding father of cybernetics.<sup>6</sup> During a series of conferences known as the Macy Conferences, which occurred in New York between 1946 and 1953, Wiener and numerous other thinkers from diverse scientific fields congregated to define common ground in the study of communication and control within and between animals and machines. The pervasive and enduring influence of cybernetics on human life has been widely documented and will not be dealt with here.<sup>7</sup> Rather, my aim is, firstly, to demonstrate that particular central concerns of Bergson's philosophy are mirrored in that of Wiener, despite the fact that they advance from diametrically opposed ontologies. Secondly, I will explain how, through the cybernetic concept of feedback, an equivalence is drawn between humans and machines, setting the stage for the dissemination of cybernetic concepts through communities of artists working with video feedback.

Wiener lays out the central tenets of cybernetics in *Cybernetics: or Control and Communication in the Animal and the Machine* (1948). In the first chapter he charts the transition in scientific thinking from a Newtonian understanding of time in the nineteenth century to one based on thermodynamic principles — where time is

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<sup>6</sup> Benjamin Peters, "Review of *Rise of the Machines: A Cybernetic History*, by Thomas Rid," *Technology and Culture*, 59, no. 2, (2018): 492–494.

<sup>7</sup> See Ronald R. Kline, *The Cybernetics Moment: Or Why We Call Our Age the Information Age* (Baltimore, MD: John Hopkins University Press, 2015); Steve Dixon, *Cybernetic Existentialism: Freedom, Systems, and Being-For-Others in Contemporary Arts and Performance* (Oxfordshire: Taylor and Francis, 2019); Spyros G. Tzafestas, *Systems, Cybernetics, Control, and Automation: Ontological, Epistemological, Societal, and Ethical Issues* (Gistrup, Denmark: River Publishers, 2017); Timothy J. Beck, *Cybernetic Psychology and Mental Health: A Circular Logic of Control Beyond the Individual* (Oxfordshire: Taylor and Francis, 2020).

irreversible — and the way in which this shift is echoed in the philosophy of Bergson.<sup>8</sup> Wiener also describes how the concept of the automaton had developed from the monadic conception of Gottfried Leibniz, as a series of perfectly wound clocks — discrete entities keeping time together “through the pre-established harmony of God” — to that of automata, whether animal or machine, defined by communication engineers as inextricably connected to the external world.<sup>9</sup> Wiener concludes that “the modern automaton exists in the same sort of Bergsonian time as the living organism,” although with the significant caveat that this by no means invalidates the mechanistic, materialist view of the world that Bergson argued against.<sup>10</sup> Wiener transposed the highly technical language of *Cybernetics* for the broader public in *The Human Use of Human Beings* (1950), expanding the influence of his ideas considerably. Although there is no specific mention of Bergson in its pages, essential features of his philosophy are reflected throughout. The central thesis, as Wiener himself puts it, is “that society can only be understood through a study of the messages and the communication facilities which belong to it,” and he is quick to point out that these facilities increasingly include communication pathways between humans and machines.<sup>11</sup> He conceives of the messages that comprise communication as patterns of information in accord with mathematicians Claude Shannon and Warren Weaver.<sup>12</sup> Through the exchange of information with the world outside of ourselves, we make adjustments to our behaviour in accordance with the contingencies we encounter. Some of this communication and control occurs automatically, governed by homeostatic biological functions, for example, the regulation of body temperature through sweating or shivering. Certain machines work in a similar way, responding to patterns of information gleaned through inbuilt sensory capacities to maintain preprogramed equilibrium states. Much of the

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<sup>8</sup> Bergson argues in *Creative Evolution* that the creation of novelty as seen in the evolution of life on Earth necessitates an understanding of time as irreversible, as opposed to the reversible, mechanistic time of classical physics where all is determined and nothing new happens. Henri Bergson, *Creative Evolution*, trans. Arthur Mitchell (London: Henry Holt and Co., 1911; New York: Random House, 1994). Citations from the Random House edition.

<sup>9</sup> Norbert Wiener, *Cybernetics: or Control and Communication in the Animal and the Machine*, 2nd ed. (Cambridge, MA: MIT Press, 1948), 42.

<sup>10</sup> Wiener, 44.

<sup>11</sup> Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society*, 2nd ed. (Boston, MA.: Houghton Mifflin, 1954; London: Free Association Books, 1989), 16. Citations refer to the Free Association Books edition.

<sup>12</sup> The pair coauthored the hugely influential book, *The Mathematical Theory of Communication* (Chicago, IL: University of Illinois Press, 1949), thereby founding the field of information theory.

control human beings exert, however, is reliant on conscious perceptions that lead to decisions for action in response to given situations.

Wiener advances control and communication as human beings' primary tools in opposition to the second law of thermodynamics — the tendency for entropy to increase over time — or, as Wiener puts it, “nature’s tendency to degrade the organized and to destroy the meaningful.”<sup>13</sup> Control is maintained, whether consciously or unconsciously, through feedback, described by Wiener as

the property of being able to adjust future conduct by past performance. Feedback may be as simple as that of the common reflex, or it may be a higher order feedback, in which past experience is used not only to regulate specific movements, but also whole policies of behaviour. Such a policy-feedback may, and often does, appear to be what we know under one aspect as a conditioned reflex, and under another as learning.<sup>14</sup>

Bergson doesn't use the word *feedback* per se but expresses, over fifty years earlier, an analogous understanding of its role in the way we regulate our behavior. In *Matter and Memory*, Bergson describes his theory concerning the relationship between perception and memory, identifying two types of memory: sensori-motor memory and pure memory. Sensori-motor memory, or habit, the type of memory that is stored in the body primed for action, parallels Wiener's conditioned reflex. Learning, for Bergson, on the other hand, is facilitated through access to pure memory, comprised of the entire record of our past conscious experience. As he puts it: “Perception is never a mere contact of mind with the object present; it is impregnated with memory-images which complete it as they interpret it.”<sup>15</sup> For Bergson, then, our perception of the present always involves some image of the past. His understanding of human perception as inextricably linked with recollection prefigures Wiener's conception of so-called policy-feedback. According to Wiener, the process of feedback necessitates an understanding of time as unidirectional, in line with Bergson, where “the apparently purposive organism, whether it is mechanical, biological, or social, is that of an arrow with a

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<sup>13</sup> Wiener, *The Human Use of Human Beings*, 17.

<sup>14</sup> Wiener, 33.

<sup>15</sup> Bergson, *Matter and Memory*, 133.

particular direction in the stream of time,” as it adjusts its behaviour in order to maintain homeostatic equilibrium.<sup>16</sup>

While Wiener equated certain self-regulatory machines with human beings, insofar as “their analogous attempts to control entropy through feedback,” he was, like Bergson, wary of the potential consequences of mechanistic thinking when applied to, and embraced by, society at large.<sup>17</sup> Wiener, conscious that we had become “slaves to our technological improvement,” cautioned against blind progress for the sake of progress alone.<sup>18</sup> As literary critic and theorist N. Katherine Hayles states in *How We Became Post Human*:

For Wiener, cybernetics was a means to extend liberal humanism, not subvert it. The point was less to show that man was a machine than to demonstrate that a machine could function like a man.<sup>19</sup>

Indeed, Wiener advocates strenuously against fascist aspirations for humanity that seek to reduce the creative capacity of humans to the determined functioning of preprogrammed automata. Those that would wish to limit humanity’s creative ability to adapt to future situations in this way, according to Wiener, were liable, if left unchecked, to “reduce our chances for a reasonably long existence on this earth.”<sup>20</sup> A perfectly reasonable anxiety now, as it was sixty years ago when Wiener wrote those words.

The potential of humankind to apply technology in creative ways is evidenced by Wiener when he describes how vacuum tubes, initially used as standard parts in telephonic communication networks, were freely repurposed after World War II, particularly in the development of broadcast television technology. He acknowledges, however, that such advances in technology do not necessarily lead to outcomes that

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<sup>16</sup> Wiener, *The Human Use of Human Beings*, 49.

<sup>17</sup> Wiener, 26.

<sup>18</sup> Wiener, 47.

<sup>19</sup> N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago, IL: University of Chicago Press, 1999), 7.

<sup>20</sup> Wiener, *The Human Use of Human Beings*, 52.

impact society in a positive way. Remarking with consternation on the state of broadcast television at the time, he writes:

Let not the fact that this great triumph of invention has largely been given over to the soap-opera and the hillbilly singer, blind one to the excellent work that was done in developing it, and to the great civilizing possibilities which have been perverted into a national medicine-show.<sup>21</sup>

Wiener argues that the increasing complexities of life demand that the technologies we rely on to access and process information, like video, are capable of doing so efficiently in order that we are able to respond effectively to them. It is clear that he considered broadcast television was failing to meet this demand. Had Bergson lived to see broadcast television he would likely have agreed. Ultimately, even though Wiener's materialism stands in stark contrast to Bergson's metaphysics, his nonetheless "generous and humane social philosophy" has much in common with Bergson's.<sup>22</sup> Both are equally aware of the necessity to garner control over our environment and the potential for the consequences of such control to lead to a society where mechanistic thinking and automatic behaviour undermine our capacity for creative action in response to the increasingly complex challenges we face as a species. Media theorist Marshall McLuhan shared these concerns about the impacts of deterministic thinking on society, incorporating both Bergson and Wiener's ideas into his own work in the following decade, as I demonstrate in the following section.

### 1.3 The Medium and The Message: Toward a Higher Power

Ten years after Wiener's *The Human Use of Human Beings*, McLuhan lays out his vision of a utopian society brought about through the widespread integration of electronic technology in *Understanding Media: The Extensions of Man* (1964). McLuhan's well-known claim in *Understanding Media* is that "the 'message' of any medium or technology is the change of scale or pace or pattern that it introduces into human

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<sup>21</sup> Wiener, 147.

<sup>22</sup> Steve J. Heims, "Introduction," in *The Human Use of Human Beings: Cybernetics and Society*, 2nd ed. (Boston, MA: Houghton Mifflin, 1954; London: Free Association Books, 1989), xix.

affairs.”<sup>23</sup> Further to this, he argues that the consequences of any medium on society are elided at the time when we are most enthralled by its various affordances because we fail to understand that each medium, from spoken and printed language to video, is an extension of ourselves. McLuhan uses the myth of Narcissus as an analogy for the way we mistakenly view extensions of ourselves as something outside of us, an error that leads to a numbness, or narcosis, toward these same extensions and their concomitant effects on society.<sup>24</sup> He explains that Narcissus, who looked into the water and found his own reflection, with which he became besotted, did not consider his reflection to be an extension of himself but, rather, as someone other whom he could never possess, resulting in despair and suicide. As McLuhan puts it:

The young man’s image is a self-amputation or extension induced by irritating pressures. As counter-irritant, the image produces a generalized numbness or shock that declines recognition. Self-amputation forbids self-recognition.<sup>25</sup>

According to McLuhan, we are like Narcissus in our failure to recognise the extension of ourselves in the media through which we communicate, and the consequences of this mistake are likely to be as calamitous as they were for Narcissus.<sup>26</sup> This analogy reflects Bergson’s description in *Time and Free Will* of a second self, detached from the true self, overly identified with the discrete multiplicities of the world and out of touch with pure duration.

McLuhan interprets Bergson’s philosophy to serve his utopian vision, taking up Bergson’s claim that clock time, as divisible and homogenous had come to pervade all sense life to detrimental effect. As if out of a passage from Bergson, McLuhan states: “The clock and the alphabet, by hacking the universe into visual segments, ended the music of interrelation. The visual desacralizes the universe and produces the ‘nonreligious man of modern societies.’”<sup>27</sup> Aside from the allusion to a loss of religion,

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<sup>23</sup> Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw-Hill, 1964; Cambridge, MA: MIT Press, 1994), 8. Citations refer to the MIT Press edition.

<sup>24</sup> McLuhan, 42.

<sup>25</sup> McLuhan, 43.

<sup>26</sup> McLuhan, 68.

<sup>27</sup> McLuhan, 155.

McLuhan invokes here, again, Bergson's conception of a second self, identified with space, living outside and out of sync with the true self. McLuhan claims that to understand the consequences of media and harness them for good we must first recognise them as extensions of ourselves. He argues that electronic media, such as video, can help to undo this erroneous doubling and that artists, in particular, perform an essential role in illuminating the influence of each new medium in no uncertain terms: "art is precise advance knowledge of how to cope with the psychic and social consequences of the next technology."<sup>28</sup> McLuhan suggests that art provides "exact information of how to rearrange one's psyche in order to anticipate the next blow from our own extended faculties."<sup>29</sup> Of the visual arts he likens video not to photography but to sculpture, regarding it as timeless, in contrast to the photographic fixing of a moment.<sup>30</sup> It is little wonder that artists were encouraged in their experiments with video given McLuhan's exhortations advocating their crucial role in guiding the evolution of human consciousness.

In his earlier book, *The Gutenberg Galaxy: The Making of Typographic Man*, McLuhan takes up French philosopher Pierre Teilhard de Chardin's concept of the *noosphere*: a membrane that exists "outside and above the biosphere," a "thinking layer" that began to grow from the "first spark of conscious reflection" by human beings.<sup>31</sup> The discovery and harnessing of electromagnetic waves, according to Teilhard, created the context wherein "each individual finds himself henceforth (actively and passively) simultaneously present, over land and sea, in every corner of the earth."<sup>32</sup> For McLuhan, following Teilhard's lead, electronic technologies, particularly media technologies such as video and computers, facilitate a turn away from mechanised, divided patterns of thought brought about by industrial technologies and toward a unitary global consciousness. In *Understanding Media*, he claims that both human bodies and consciousness were extended through electronic media to the point where this extension

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<sup>28</sup> McLuhan, 66.

<sup>29</sup> McLuhan, 66.

<sup>30</sup> McLuhan, 188.

<sup>31</sup> Pierre Teilhard de Chardin, *The Phenomenon of Man*, trans. Bernard Wall (New York: Harper, 1959; New York: Harper Perennial, 2008), 183.

<sup>32</sup> Marshall McLuhan, *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962), 32.



would catalyse “the technological simulation of consciousness, when the creative process of knowing will be collectively and corporately extended to the whole of human society.”<sup>33</sup> McLuhan argues that while mechanised society created fragmentation and division, an electronic society promoted unification. It is this overarching argument that sets McLuhan apart from Bergson quite starkly. While they are aligned in their passion for freedom from mechanised thought and action, McLuhan, following Teilhard, conformed to an idea of evolution that led to unity, whereas for Bergson, evolution was a process of differentiation. Bergson scholar Stephen Crocker describes Teilhard and McLuhan as proponents of a distinctly “Catholic Bergsonism,” through which they might “produce a metaphysics adequate to our mechanical/technological age.”<sup>34</sup> Crocker’s claim is borne out most succinctly when McLuhan declares that the computer “promises by technology a Pentecostal condition of universal understanding and unity.”<sup>35</sup> McLuhan’s media theory, it seems, was conceived teleologically in accordance with his belief in the inexorable unification of humankind under God.

McLuhan’s utopian, almost evangelical fervor for the unifying power of electrical technology is perhaps most obvious in the final chapter of *Understanding Media* on automation and cybernation. Here, he argues that the feedback of cybernetics signaled the end of the linear patterns of thought induced by alphabets and language, famously prefiguring the internet when he describes the “weaving of individual machines into a galaxy of such machines throughout the entire plant.”<sup>36</sup> For McLuhan, the loss of jobs to automation was a positive force in society, allowing more time for learning at the lightning-fast pace that electronic technology allowed. His claim, however, that “electric speed-up and interdependence... has ended the assembly line in industry,” was not true then, nor could it be further from the truth now.<sup>37</sup> Human beings in large numbers continue to perform discrete functions in assembly lines that produce an increasing array of technological products, including smartphones, that incorporate the multifaceted media extensions of human beings that McLuhan presaged. Evidently,

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<sup>33</sup> McLuhan, *Understanding Media*, 4.

<sup>34</sup> Stephen Crocker, *Bergson and the Metaphysics of Media* (London: Palgrave Macmillan, 2013), 19.

<sup>35</sup> McLuhan, *Understanding Media*, 80.

<sup>36</sup> McLuhan, 354.

<sup>37</sup> McLuhan, 353.

McLuhan's utopia has not yet eventuated, although his ideas have been widely disseminated. He went on to become something of a celebrity, appearing numerous times on broadcast television to expound on his theories of media. His one-time research assistant Paul Ryan went on to become a highly influential video artist and activist.<sup>38</sup> Ryan joined with others in the late 1960s to form counterculture activist group Raindance Corporation, a collective of artists and thinkers dedicated to sharing knowledge about the potential artistic and political uses of video technology. In the following section I outline how the ideas espoused by Wiener and McLuhan filtered through to communities of artists via the work of Raindance Corporation and media theorist Gene Youngblood.

#### 1.4 Radical Software and Expanded Cinema: Calls to Artistic Action

In 1970, Raindance Corporation published the first edition of *Radical Software* in New York.<sup>39</sup> Contributors to the journal, published between 1970 and 1974, included artists Paul Ryan, Merrily Paskal, Eric Siegel, Ann Arlen, Kira Gale, Dan Graham, and Nam June Paik; theorists Buckminster Fuller, Marjorie Kawin-Toomin, and Gene Youngblood; as well as activist groups Video Freex Inc. and Global Village. Influenced by ideas from cybernetics and encouraged by McLuhan's conviction that artists were heralds of a new conscious age, the first issue included a manifesto that advocated for the use of video technology to "design and implement alternate information structures which transcend and reconfigure the existing ones."<sup>40</sup> Contrary to McLuhan's assertions that electronic media would catalyse a change in mechanised ways of thinking, broadcast television continued, mostly, to present regularly scheduled programs dividing time into predictable patterns of entertainment, including news, drama and situation comedy. The editors accused network broadcasters of using television to "reinforce product oriented and outdated notions of fixed focal point, point of view, subject matter, topic, asserting their own passivity, and ours, giving us feedback of

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<sup>38</sup> See William Kaizen, "Steps to an Ecology of Communication: Radical Software, Dan Graham, and the Legacy of Gregory Bateson," *Art Journal* 67, no. 3 (2008): 86–106, DOI: 10.1080/00043249.2008.10791316.

<sup>39</sup> Raindance Corporation member Michael Shamberg also published *Guerrilla Television* in 1971, a manifesto for the decentralisation of television. *Radical Software* ceased publication in 1974.

<sup>40</sup> Korot and Gershuny, *Radical Software* 1, inside cover text.

feedback of information rather than asserting the implicit immediacy of video.”<sup>41</sup>

Promoting a countercultural movement, they sought to provide people with “access to the informational tools they need to shape and reassert control over their lives,” through the novel use of video technology.<sup>42</sup>

Gene Youngblood, a zealous proponent of video technology, states his utopian vision for video as a tool for revolution across the world in this first edition of *Radical Software*. He denounces broadcast television whilst advocating for a revolution using the means of its making:

Television is the software of the earth. The videosphere is the *noosphere* — global organized intelligence — transformed into a perceivable state. This implosive, self-revealing, consciousness-expanding process is irreversible... Global television is directly responsible for the political turmoil that is increasing around the world today... the new generation with its transnational interplanetary video consciousness will not tolerate the miniaturized vaudeville that is television as presently employed. We will liberate the media.<sup>43</sup>

This single page incitement in *Radical Software* is a compilation of excerpts from Youngblood’s book *Expanded Cinema*, published the same year, in which he argues for the potential of cinema, video and emerging computer technology to extend the communication possibilities of humankind, thereby expanding consciousness. He uses the term *videosphere* to denote the global influence of television as a way of extending human senses “to the farthest star and the bottom of the sea,” going so far as to say that it “transcends telepathy.”<sup>44</sup> Like McLuhan, Youngblood adopts Pierre Teilhard de Chardin’s concept of the noosphere and attributes a global awakening to the arrival of the videosphere, which he conceives of as Teilhard’s “noosphere transformed into a perceivable state.”<sup>45</sup> He views the commercial entertainment industry as an impediment to the expansion of human consciousness, arguing that formulaic commercial

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<sup>41</sup> Korot and Gershuny, inside cover text.

<sup>42</sup> Korot and Gershuny, inside cover text.

<sup>43</sup> Gene Youngblood, “The Videosphere,” in *Radical Software* 1, no. 1 (1970): 1.

<sup>44</sup> Gene Youngblood, *Expanded Cinema* (New York: P. Dutton & Co., 1970), 260.

<sup>45</sup> Youngblood, 78.

entertainment — be it cinema or television — perpetuates a habitual, unthinking, response that extends into everyday life, ultimately inhibiting self-awareness.

Youngblood draws on McLuhan's media theory and Wiener's cybernetics in unique ways to further his argument for expanded cinema as the solution for a society in peril and the role of artists in advancing it. He reconceives entropy as "the degree of ignorance" humanity has about the human condition and feedback as the only process that negates it through recursive incremental change. He invokes Wiener to explain that "the more probable the message, the less information it gives,"<sup>46</sup> concluding that "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."<sup>47</sup> In this way, Youngblood defines entertainment as inherently entropic, as the positive feedback of broadcast television, for example, becomes less and less informative. Art, on the other hand, is negentropic, and he, like McLuhan, views artists working with video as essential proponents in addressing the perceived ignorance of humankind through the expansion of human consciousness.

Youngblood's theories in *Expanded Cinema* derive, though somewhat obliquely, from those espoused by Wiener, Teilhard and McLuhan, who in turn draw from or reflect central concepts of Bergson's philosophy. Each of these thinkers connects technology to human consciousness and their ideas filtered through to communities of artists working with video feedback. Youngblood's particular influence on the artworld was widespread, not least of all within the group of artists who were closely involved with *Radical Software*. One such artist was Dan Graham, a frequent contributor to *Radical Software*, who in the 1970s became interested in the way video feedback could be used to influence human temporal perception.

## 1.5 Video Feedback: An Uncanny Mirror

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<sup>46</sup> Youngblood, 63.

<sup>47</sup> Youngblood, 64.

Multidisciplinary artist Dan Graham created several video installations in gallery settings during the 1970s that made use of mirrors and extended video feedback loops on time delay.<sup>48</sup> Graham's *Present Continuous Past(s)* (1974) looks deceptively simple as an installation. (fig. 2) The viewer enters an enclosed rectangular room with mirrored walls directly in front of them and to their left. To their right is a large video monitor with a camera on top of it. The mirror directly opposite reflects the present. The monitor shows the camera view but delayed by eight seconds. If the viewer does not obscure the lens of the camera, it is capturing the entire reflection of the room and anything in it including the monitor itself that is displaying the delayed video feed. When the viewer looks at the monitor, they see the image of themselves entering eight seconds prior and also the reflection of the monitor in the mirror from sixteen seconds ago. In this way, "an infinite regression of time continuums within time continuums... is created."<sup>49</sup> Graham's intention to bridge the divide between the viewer's vision of their own behaviour and their subjectivity is realised in this work.

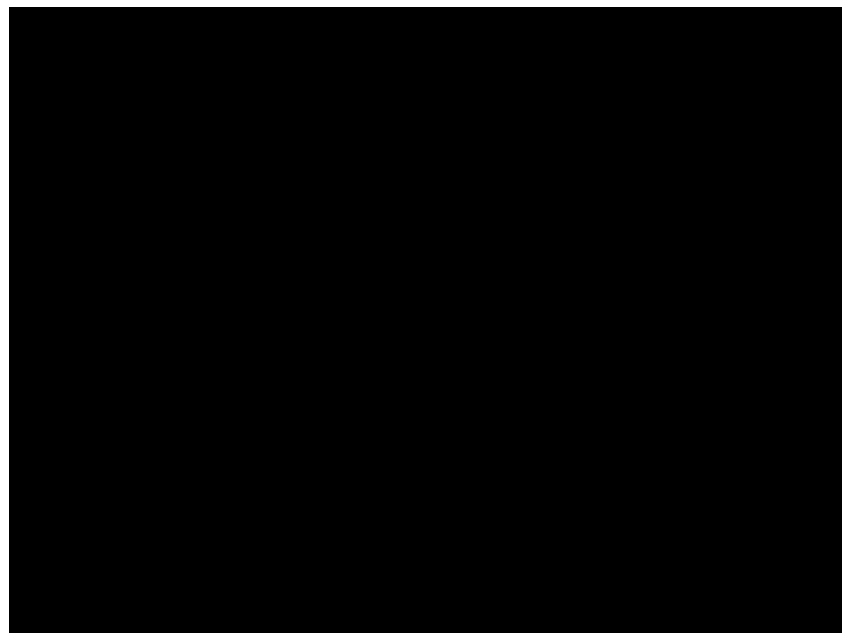


Figure 2: Dan Graham, *Present Continuous Past(s)* (1974), artist's sketch,  
<http://www.medienkunstnetz.de/works/present-continuous-pasts/>.

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<sup>48</sup> Several artists were using mirrors with video in that same decade, including Joan Jonas, whose video performances between 1972 and 1976 incorporated mirrors as a way of "exploring the gaps between reality and illusion." John Neylon, *Mirror Mirror: Then and Now* (Adelaide: Anne & Gordon Samstag Museum of Art, 2010), 14.

<sup>49</sup> Dan Graham, "Video in Relation to Architecture," in *Illuminating Video: An Essential Guide to Video Art*, eds. Doug Hall and Sally Jo Fifer (New York: Aperture/BAVC, 1990), 186.

Graham used *Present Continuous Past(s)* and other works such as *Opposing Mirror and Video Monitors on Time Delay* (1974), to engage with what he claims was a dominant premise of modernist art in the 1960s: that “the world could be experienced as pure presence, self-sufficient and without memory.”<sup>50</sup> He contends that these works critique this privileging of the present, uncontaminated by past or future, which as well as “foregrounding an awareness of the presence of the viewer’s own perceptual process, [show] the impossibility of locating a pure present tense.”<sup>51</sup> Whether consciously or not, Graham with these words and artworks, invokes Bergson’s pure duration, which conceives of memory and consciousness as inseparable and time as indivisible.<sup>52</sup> By placing a very recent past version of the viewer side by side with the present version and asking if they can spot the difference, Graham draws viewers into new relations with themselves — extended, reflected, and delayed — through the medium of video.

British artist David Hall’s *Progressive Recession* (1975) also dislocates viewers in time and space. (fig. 3) The installation consists of nine monitors with video cameras on top of them, each sending a live feed to one of the screens, but not necessarily the screen it sits atop. There is a camera/monitor set up at either end of a long rectangular room facing each other and seven camera/monitor setups along one long wall. As the viewer moves through the room their video image is progressively distanced from their physical self as the live output of each camera is sent to monitors further up or down the line, creating a video hall of mismatched mirrors that causes viewers to question where and when they in fact are. Viewers engage with the live image of themselves, extended through video, detached from their conscious selves moving in time. Hall explains the effect of this and similar works produced around this time as “a process of self-referring consciousness,” invoking McLuhan’s conception of video as an extension of human consciousness, the myth of Narcissus, and pointing toward a parallel between the workings of the human mind and video feedback loops.<sup>53</sup>

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<sup>50</sup> Graham, 186.

<sup>51</sup> Graham, 186.

<sup>52</sup> As described in detail in the introduction to this thesis.

<sup>53</sup> David Hall, “The Video Show,” *Art and Artists* 10, no. 2, issue 110 (1975): 22.

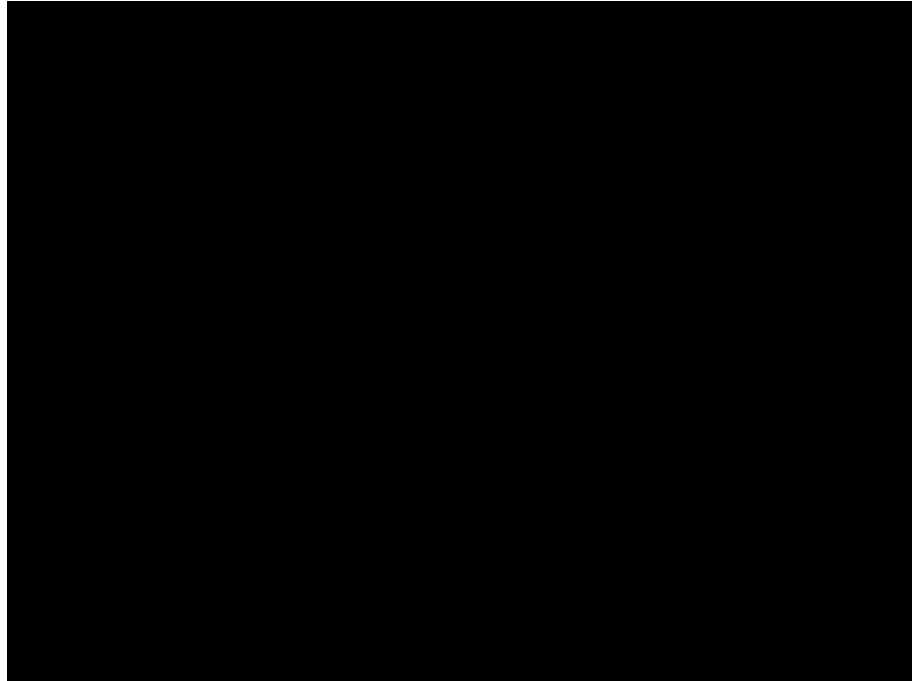


Figure 3: David Hall, *Progressive Recession* (1975), installation view, Serpentine London Gallery, 1975, [https://www.luxonline.org.uk/artists/david\\_hall/progressive\\_recession.html](https://www.luxonline.org.uk/artists/david_hall/progressive_recession.html).

With these works Hall and Graham live up to both McLuhan and Youngblood's expectations of artists' proficiency in revealing the influence of video on human consciousness beyond the limitations of broadcast television, prompting novel behaviour in viewers. By using video feedback to position viewers in unique modes of self-reflection, these artists shaped an understanding of video as an extension of human consciousness. By dislocating viewers from their live image in space and making their recent past visible alongside their unfolding present, they questioned the traditional correlation of time and space and pointed to the impossibility of a discrete present moment. Bergson would surely have approved. While these artists were positioning viewers within extended video feedback loops, others were using direct and indirect feedback to produce abstract work that explored human consciousness in entirely different ways. Rather than pointing to video as an extension of consciousness per se, other artists, such as Eric Siegel and Peter Donebauer, used feedback to evoke alternative modes of consciousness, drawing not only on theories derived from cybernetics, but those espoused in Eastern philosophy and Jungian psychology.

## 1.6 Creative Consciousness: Under the Influence of Video Feedback

When artists in the West began working with video feedback in the 1960s and 1970s, Eastern philosophies and spiritual practices had become mainstream there.<sup>54</sup> Both Hindu and Buddhist philosophies are centred around the practice of insight meditation in order to practice the detachment required to achieve enlightenment, the ultimate goal of both philosophies. In both traditions, insight meditation requires “reflection of the truth within oneself, the world, and the nature of knowledge itself,” and Western artists had been engaged with these reflections for some time.<sup>55</sup> One such artist was abstract filmmaker James Whitney, who had spent much of the decade of the 1950s creating his experimental film *Yantra* (1957). Constructed from thousands of hand-drawn images, it depicts constantly moving dots that alternate between forming complex organised mandala patterns and falling into chaos. Whitney describes *Yantra* as an attempt “to emulate the expanded consciousness produced by Yogic practice,” and although made on film, it clearly anticipates and surely influenced artists working with video feedback in later decades.<sup>56</sup>

In 1958, as video technology was becoming available to artists as a tool for exploring human consciousness, psychologist Carl Jung described modern art as “performing a work of psychological education on the public.”<sup>57</sup> By shattering conventional aesthetic understandings about what was considered beautiful and meaningful, Jung recognised that modern art had turned from “the naïve and romantic delight in the senses and their obligatory love for the object... towards the... dark chaos of subjectivisms.”<sup>58</sup> Jung saw in modern art a destructive tendency that mirrored the mood existing across the world at that time, and thought that artists had not yet found

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<sup>54</sup> See Shetal Vohra-Gupta, Amy Russell and Elsie Lo, “Meditation: The Adoption of Eastern Thought to Western Social Practices,” *Journal of Religion & Spirituality in Social Work: Social Thought* 26, no. 2 (2007): 49–61.

<sup>55</sup> Vohra-Gupta, Russell and Lo, 55.

<sup>56</sup> Edward A. Shanken, *Art and Electronic Media* (New York: Phaidon, 2009), 80. Whitney continued his work in visualising mandalas into the 1960s, making *Lapis* from 1963 to 1966, using an early analogue computer to manipulate layers of dot images painted on glass to create images of slowly revolving circular structures with incredibly intricate geometry.

<sup>57</sup> Carl Jung, *The Undiscovered Self* (London: Routledge & Kegan Paul, 1958; Oxfordshire: Taylor & Francis e-Library, 2005), 77. Citations refer to the Taylor & Francis edition.

<sup>58</sup> Jung, 77.



within the darkness the thing that might “give expression to their psychic wholeness.”<sup>59</sup> That thing, or more rightly those things, for Jung, are archetypes: manifestations of latent physiological urges, or instincts, “without known origin,” appearing spontaneously within dreams, in visions, or in waking thoughts.<sup>60</sup> According to Jung, “archetypes create myths, religions, and philosophies that influence and characterize whole nations and epochs of history.”<sup>61</sup> The analysis of these archetypes lies at the centre of Jungian psychological practice.

Jung developed his theory of analytical psychology based on the premise that a person’s psychological health is dependent on the integration of the conscious and the unconscious. According to Jung, psychological problems occur when these two spheres of the psyche become separated from one another through the formation of a persona separate from the person. He claims that through the analysis of dreams, in which personal and archetypal symbols are revealed to human consciousness, this division could be healed. According to Jung, this unification was a slow, often lifelong process he called *individuation*, as “the conscious and the unconscious within an individual learn to know, respect, and accommodate one another.”<sup>62</sup> Bergson scholar Pete A. Y. Gunter establishes an equivalence between Jung’s psychological theories and Bergson’s philosophy, showing how Bergson anticipates Jung’s person-persona contrast in his conclusion to *Time and Free Will*, where he argues that our identification with discrete multiplicities in space leads to the creation of a second self.<sup>63</sup> Gunter presents several examples where Jung himself acknowledges the parallels between his own thinking and that of Bergson, aligning his concept of libido closely with Bergson’s *élan vital*.<sup>64</sup> Jung’s influence is evident, along with that of those thinkers already discussed in this chapter,

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<sup>59</sup> Jung, 77.

<sup>60</sup> Jung, 69.

<sup>61</sup> Jung, 79.

<sup>62</sup> John Freeman, “Introduction,” in *Man and His Symbols*, ed. Carl G. Jung and M.-L. von Franz (New York: Anchor Press Doubleday, 1964), 14.

<sup>63</sup> Pete A. Y. Gunter, “Bergson and Jung,” *Journal of the History of Ideas* 43, no. 4 (1982): 635–652.

<sup>64</sup> Gunter also highlights an important distinction between the thinking of Teilhard and Bergson, in that Teilhard saw evolution leading to convergence in opposition to Bergson, who conceived of evolution as a process of divergence. Bergson and Jung fundamentally disagree with Teilhard, McLuhan and Youngblood on this point, though each, as I have discussed previously, did believe in the capacity of human creativity to create a better world.

in the work of artists Eric Siegel and Peter Donebauer, towards whom my discussion will now turn.

Eric Siegel, a contributor to *Radical Software*, created his influential video trilogy *Psychedelivision In Color* (1968–1969) using video feedback routed through the Siegel Colorizer, a colour synthesiser he had built himself.<sup>65</sup> *Psychedelevision* is a work in three acts — *Einstein*, *Symphony of the Planets* and *Tomorrow Never Knows* — exhibiting all the usual hallmarks of direct feedback, including the constant motion of colours and shapes streaming from the centre of the screen that create tunnels or vortexes, along with seemingly organic structures morphing ever anew. *Einstein* begins with a circle within a circle growing slowly from the center of the screen and transforming into a more triangular shape as it recurs inside itself. A voice speaks the words “travelling, five hundred light years” twice, after which the recursive shapes begin to fragment into dozens of strands of multi-coloured feedback warping over a still image of Albert Einstein’s face that has slowly appeared. (fig. 4) This continues for the remainder of the six-minute piece. In the last thirty seconds the image of Einstein dissolves and gives way to the feedback now contained within a circle that slowly grows smaller before the tape ends. The explicit use of Einstein’s image in the work, coupled with the words spoken at the outset, call to mind his theory of relativity and its implications for the measurement of time, where a moving clock appears to tick more slowly than a stationary clock according to a particular observer. Einstein disagreed with Bergson in his fundamental conception of time, but what the two did have in common was an understanding of a necessary limit on a “purely rational conception of our existence.”<sup>66</sup> Einstein admits that “those convictions which are necessary and determinant for our conduct and judgements, cannot be found solely along this solid scientific way... One can have the clearest and most complete knowledge of what *is*, and yet not be able to deduct from that what should be the *goal* of our human aspirations.”<sup>67</sup> Einstein aligns with Bergson here when he acknowledges that an alternative approach to knowledge is most

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<sup>65</sup> Siegel is one of a number of artists who developed video synthesisers alone and in collaboration with others in order to bend the medium to their will.

<sup>66</sup> Albert Einstein, *Out of My Later Years: The Scientist, Philosopher, and Man Portrayed Through His Own Words* (New York: Open Road Media, 2011), 34.

<sup>67</sup> Einstein, 34 (emphasis in original).

appropriate for dealing with such questions. By warping the image of Einstein, Siegel appears to question scientific conceptions of time and I would suggest, by extension, the value of conventional reason in determining the future direction of humanity.

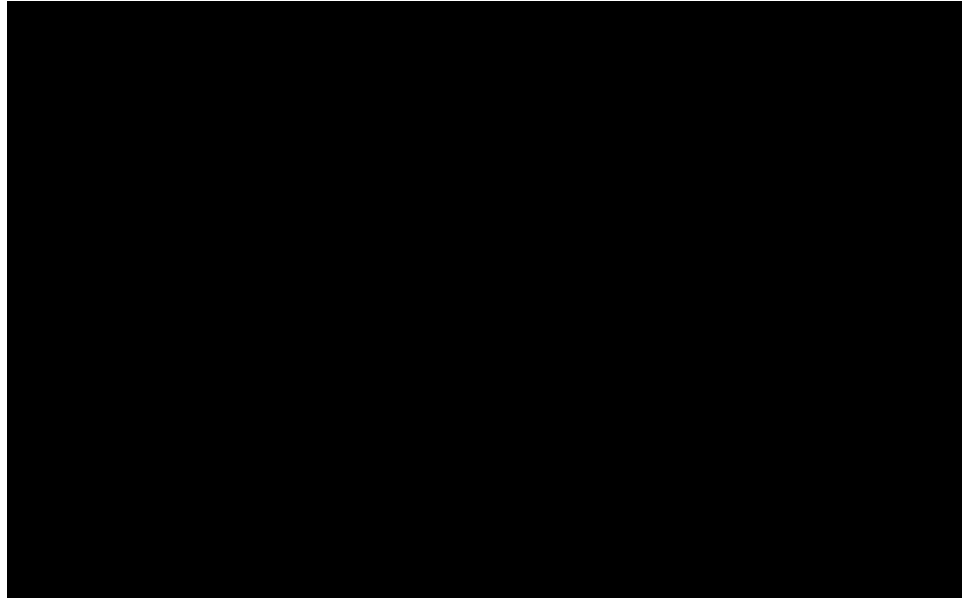


Figure 4: Eric Siegel, *Psychedelelevision* (1968-1969), video still of online documentation, <https://www.vdb.org/collection/gallery/all/3181>.

The second act of *Psychedelelevision*, *Symphony of Planets*, displays a series of seemingly organic structures for almost twelve minutes, beginning with a spiral of spheres arcing out from the centre of the screen that develop into shapes that resemble birds or stingrays, continuously transmuting.<sup>68</sup> Finally, *Tomorrow Never Knows* takes its title from the Beatles song of the same name, used as the soundtrack for the journey through constantly moving psychedelic feedback that makes up its three minutes. The lyrics of the track invite the listener to turn off their mind, surrender to the void and listen to the colour of their dreams, echoing Jung's notion that dreams hold the key to reuniting humanity with their subconscious instincts.<sup>69</sup> Siegel himself saw *Psychedelelevision* as an "attempt at video mind expansion," part of his utopian vision to liberate television and create a new science that might limit what he considered the

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<sup>68</sup> In chapter 3 I discuss the appearance of seemingly organic forms in video feedback in detail.

<sup>69</sup> The experimental track by the Beatles, for which the band used tape loops, non-standard drum patterns and reversed guitar, is an appropriate accompaniment to the psychedelic video feedback of Siegel's work.

decay of the American Dream.<sup>70</sup> The title is an obvious reference to the fashionable use of mind-expanding psychedelic drugs during the 1960s, but the work actually attends to a complex fusion of ideas including scientific and philosophical notions of time as well as elements of Jungian psychology. Siegel's drive to expand human consciousness through video feedback led him to conceive of inserting a human being into a feedback loop with impulses from the person's brain sent to a screen, where they would witness their neurological reactions to the infinitely recursive loop of visualised information. Although this idea never came to fruition for Siegel, that he conceived of it attests to his strong belief in the power of video to change humanity for the better.

Peter Donebauer shared Siegel's belief in the transformative power of video. He was drawn to the immediacy of video in the 1960s because of the speed at which feedback could mimic natural processes of creation, presenting a "powerful medium for creating an abstract, symbolic archetypal imagery."<sup>71</sup> He was interested in exploring experiences outside of everyday consciousness, such as dream states, meditative states and drug-induced states, in which the experience of time differs from usual states of mind. Donebauer cites Jung's *Man and His Symbols* (1964) as an influence on his work, particularly the posited archetypal structures within individual consciousness that give rise to creative acts across all cultures and historical periods.<sup>72</sup> Donebauer's main focus in the 1970s was on real-time performance to produce organised images live, "without the necessity of mediation through verbal or conceptual structures."<sup>73</sup> He echoes McLuhan's sentiments here, that electronic media would facilitate the expansion of human consciousness without the need for "any verbalization whatever,"<sup>74</sup> but he is

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<sup>70</sup> Quoted in Youngblood, *Expanded Cinema*, 316.

<sup>71</sup> Chris Meigh-Andrews, "Transcript of recorded interview with Peter Donebauer," London, 8 March, 2000, accessed 13 May, 2018, <http://www.meigh-andrews.com/writings/interviews/peter-donebauer>.

<sup>72</sup> Peter Donebauer, "Archetypes-Mandalas-Consciousness," accessed 6 April, 2018, <http://www.donebauer.net/themes/archetypes-mandalas-consciousness>. Jung's final book, *Man and His Symbols*, was published three years after his death. Written with trusted colleagues, it explains Jung's theories in a broadly accessible style, for the first time bringing his life's work within the grasp of the general public. Jung's deep engagement with spiritual practices from across the globe combined with his theories of individuation through analysis of dreams and the unconscious struck a chord with artists like Donebauer, looking to expand the horizons of human consciousness and discover untapped layers of reality. Carl G. Jung and M.-L. von Franz, eds., *Man and His Symbols* (New York: Anchor Press Doubleday, 1964).

<sup>73</sup> Peter Donebauer, "Video-Music," accessed 6 April, 2018, <http://www.donebauer.net/themes/video-music>.

<sup>74</sup> McLuhan, *Understanding Media*, 80.

actually referring to Jung's archetypal symbols that arise from the unconscious, impossible to define or explain, that represent "ideas that lie beyond the grasp of reason."<sup>75</sup> Donebauer recognises time as experienced by human beings in two variations, as both linear and cyclical. His works unfold in the linear time of live, durational performance but are often structured as a cycle, returning to look and sound as they did when they began. He aligns a cyclical understanding of time to the Hindu notion of a *yuga* (Sanskrit: 'age'), and the cycle of the four dharmic ages that begin with perfection and decline into spiritual chaos. Donebauer cites these metaphysical ideas as "contextualising our lives and experience within a greater whole than our narrow perspective and experience," where each human life exists within the context of multiple cycles within nature as seen in the changing of the seasons and the orbits of the planets.<sup>76</sup>

Most of Donebauer's artworks in the 1970s were recorded live in a studio in collaboration with other electronic artists and musicians. Donebauer would decide on a theme to guide each session, for which each performer had live feedback of one another's audiovisual outputs. This improvisational mode can be characterised as akin to Bergson's pure duration, the conscious states of the participants hovering between perception and recollection, chaos and control, indivisibly fluid as they respond to the live feedback of each of their collaborators. These works were not intended to impart specific meanings, rather the abstract visual forms that Donebauer and his collaborators conjured were designed to encourage audiences to engage with the mysteries of consciousness and creation.

*The Creation Cycle* (1973–1978) is a series of seven video recordings of live studio sessions with various other artists and musicians using video feedback and exploring different aspects of creation. *Beginning* (1973), the first in the series, displays the most chaotic imagery, with each successive work showing different patterns of organisation to the feedback. In 1975, Donebauer and collaborator Richard Monkhouse

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<sup>75</sup> Carl Jung, "Approaching the Conscious," in *Man and His Symbols*, ed. Carl G. Jung and M.-L. von Franz (New York: Anchor Press Doubleday, 1964), 21.

<sup>76</sup> Peter Donebauer, "Time-Processes," accessed April 6, 2018, <http://www.donebauer.net/themes/time-processes>.

completed work on the Videokalos Colour Synthesiser. The Videokalos brought together multiple video imaging capacities normally requiring separate processors into one machine, allowing for significant control over the image produced. This greater control over the video feedback resulted in the more refined works that made up the remainder of *The Creation Cycle*. The indirect feedback in *Circling* (1975) strongly resembles spinning galaxies, calling to mind astronomical cycles, and *Teeming* (1975) displays geometrical shapes most aptly described as mandalas. (fig. 5)



Figure 5: Peter Donebauer, *Teeming* (1975), video still of online documentation, <https://vimeo.com/181336863>.

Jung wrote extensively about mandalas, both as ritual instruments in eastern meditation practice and as useful expressions of any individual's current psychological state, and therefore are useful symbols in assisting the process of individuation. In its simplest form a mandala is a circle. In Jungian psychology, a circle or sphere designates "the totality of the psyche in all its aspects, including the relationship between man and the whole of nature."<sup>77</sup> As an image of wholeness, a mandala is seen to serve both a restorative purpose and a creative one, where the restoration of former order requires an element of novel creation. In this "new order the older pattern returns on a higher level," thereby helping to advance the user further through the process of

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<sup>77</sup> Aniela Jaffe, "Symbolism in the Visual Arts," in *Man and His Symbols*, ed. Carl G. Jung and M.-L. von Franz (New York: Anchor Press Doubleday, 1964), 240.

individuation.<sup>78</sup> Jung regarded an appearance of a mandala to an individual as “an *attempt at self-healing* on the part of Nature, which does not spring from conscious reflection but from an instinctive impulse.”<sup>79</sup> According to Jung, a mandala can be “drawn, painted, modelled, or danced,” and as artists like Donebauer discovered, they can also be shaped using video feedback.<sup>80</sup> By making mandalas move, Donebauer’s intention was to increase the effect of one’s experience of a mandala, the movement of the eye from inner to outer and back intended to link the viewer more closely with the universe. In his own words, “it felt obvious that to do this dynamically with a moving medium would add a considerable level of effectiveness to the more traditional static form.”<sup>81</sup> Viewed in this way, *Teeming* represents a coherent attempt to use video feedback to inspire the restoration of humanity’s connection with nature in accordance with Jung’s philosophy of mind. As a suite of works, *The Creation Cycle* documents a sustained practice in live collaborative improvisation with audio-visual feedback among artists and musicians exploring both their individual and collective creative consciousness. In these very different ways to Graham, Hall and Siegel, Donebauer and his collaborators also used video feedback to delve deeply into what it means to be conscious under the influence of video.

Despite their attempts to gain artistic control of video, these four artists’ efforts to expand the minds of humanity did not bring about the broad social changes envisioned by McLuhan or Youngblood. Reflecting on McLuhan’s utopian vision for the future, Paul Ryan pointed out that:

Video did not make the blind see... There has been no resolution of the problematics underlying the industrial culture promulgated by broadcast television... Technological improvements in video equipment have shifted the emphasis from process values to

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<sup>78</sup> M.-L. von Franz, “The Process of Individuation,” in *Man and His Symbols*, ed. Carl G. Jung and M.-L. von Franz (New York: Anchor Press Doubleday, 1964), 225.

<sup>79</sup> Carl Jung, *Mandala Symbolism*, trans. R. F. C. Hull (Princeton, NJ: Bollingen Foundation, 1959; Princeton, NJ: Princeton University Press, 2017), 4 (emphasis in original). Citations refer to the Princeton University Press edition.

<sup>80</sup> Jung, *Mandala Symbolism*, 3.

<sup>81</sup> Donebauer, “Archetypes, Mandalas and Consciousness.”

production values. Personal computers have displaced video as the electronic medium of possibility in people's imaginations.<sup>82</sup>

Indeed, the intervening years have seen wave after wave of technological development in media from analogue to digital video, from fax machines to video teams and yet the world is no more unified than it was fifty years ago. In 2007 the first smartphone, the iPhone, was released by Apple, providing access to video technology that fits in the palm of our hands, along with constant, autonomous access to global communication via the internet. Following McLuhan, it is an incontestable fact that smartphones are an extension of our consciousness. They allow us to communicate via speech, text and with still and moving images that we can manipulate in ways unimagined fifty years ago: communication and control between humans via machines has become a given. Video technology has progressed from the Sony Portapak to the iPhone, from comprising electrical signals to packets of digital data. Aspect ratios have changed from standard definition (4:3) to widescreen (16:9) to vertical (9:16) to the Instagram square (1:1), but video continues to divide lived time into discrete segments, providing us a semblance of control over the contingencies of the world. Nonetheless, artists have not lost hope in the artistic potential of video feedback to inspire new ways of thinking about and experiencing video technology. Due in no small part to the pioneering work of artists working with video feedback, including those discussed so far in this chapter, along with the words of McLuhan and Youngblood that have continued to echo into the present, artists — including myself — have persisted in working with video feedback to produce novel ways of thinking about consciousness and time.

The first work that I created as part of *The Feedback Suite* developed out of my original experiments with digital video feedback using an iPhone, WIFI network and laptop computer. As I maneuvered my smartphone in response to its output on my computer monitor, I felt like I had discovered video feedback for the very first time.

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<sup>82</sup> Paul Ryan, *Video Mind, Earth Mind: Art, Communication and Ecology* (New York: Peter Lang, 1993), 323–324.



## 1.7 Eye of The Beholder: Perception of Perception

*Eye of The Beholder* (2015) is a three-minute single-channel video in a seamless loop presented in portrait mode on an iPhone 6. ([link to video documentation](#)) It begins with a shimmering nebulous white shape constantly morphing and moving toward the viewer. The edges of the continuously moving form are tinged with multiple colours of changing hue: green, yellow, blue and orange. There is a kind of flash, the spill of light from somewhere outside of the frame, and the form begins to take a more cohesive shape, vertical lines, almost grid-like structures, still constantly moving toward the viewer, giving the feeling of travelling through energy fields. These are the familiar shapes and movements of direct video feedback. (fig. 6) At approximately one minute in — a third of the way through the piece — an instantly recognisable icon appears: a yellow square with a small sun to its right, the symbol used in the iPhone camera user interface denoting focus and exposure control. A stable form solidifies and ‘floats’ on the screen. There is a subtle dissolve edit as the combined focus and exposure icon fades away and reappears further down the screen, although the same form still ‘floats’ on the screen behind it. This form might be interpreted as any number of things, but it resembles foremost a disembodied eye, with green-hued pupil and yellowy orange lids, blinking slowly for about a minute before devolving back into amorphous digital video feedback. This de-evolution is punctuated by the large square focus icon that denotes the autofocus function of the software appearing in the centre of the screen, resulting in a change in direction of the swirling feedback, as the shimmering blobs that appeared at the beginning of the video return. The dual control icon appears again, reorienting the direction of the feedback. What follows is a quick succession of appearances of the two icons, each one in turn influencing the consequent shape and direction of the visual imagery resulting from the video feedback loop. The larger square is the last we see — the automatic function of the camera — itself giving way to gridded feedback, latticed and morphing into zigzag lines and multicoloured blobs before fading once again to black.

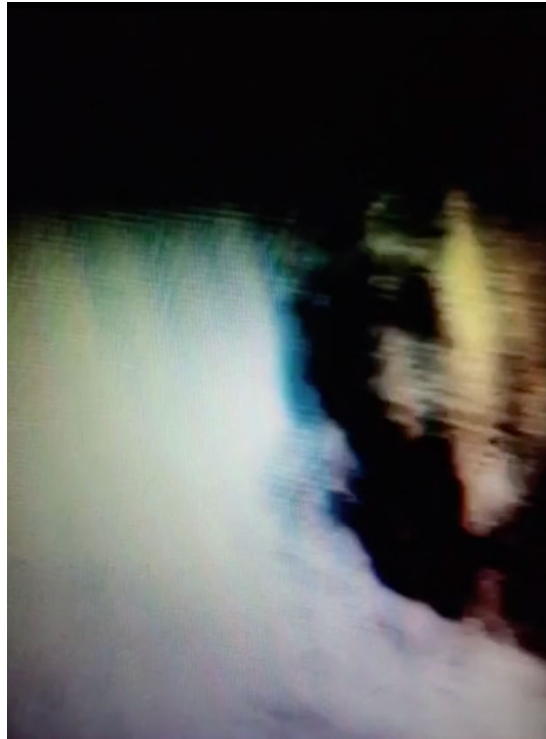


Figure 6: Justin Harvey, *Eye of the Beholder* (2015), video still.

The source materials for *Eye of the Beholder* (*EOTB*) were captured from a direct video feedback loop created using an iPhone camera application, Wi-Fi network and laptop computer. The iPhone was handheld and pointed at the video output of the camera and a series of screen recordings were made to capture the outcomes of the feedback sessions. During these sessions, both myself and certain algorithms embedded within the camera software each, at certain times, add negative feedback into the positive feedback loop in respective attempts to control the image. There are three factors at play that are relevant to a reading of *EOTB* within the context of this chapter: the foregrounding of the smartphone and its interface, the struggle for control between human and machine, and the perception of perception invoked via the appearance of the ephemeral ‘eye’. I will deal with them one at a time.

Although *EOTB* is presented on an iPhone in portrait mode, it is not clear at first whether it was created using that same technology. This fact is made explicit about a minute into the work with the appearance of the dual focus and exposure icon of a small yellow square and a sun symbol. (fig. 7) With the appearance of this icon it becomes

clear that the viewer is looking at a recording of a live feed from an iPhone. The combination of the camera application's icon and the fact that the work is also viewed on an iPhone leads viewers to understand that it was made on the smartphone and recorded as a screen capture. The direct reference to the use of a smartphone to produce *EOTB* acknowledges that it was made using an everyday tool for image creation and contextualises it within a moment of unprecedented volume of production of digital still and moving images. This explicit use of a smartphone camera in the creation of *EOTB* reveals my intention to resist the typical use of this contemporary video imaging technology. This intention accords with those of the artists discussed earlier in this chapter who used video technology in the 1960s and 1970s as a way of resisting the perceived hegemony of broadcast television in efforts to contribute to the expansion of human consciousness. Instead of using the video cameras of the day to capture external reality, these artists turned them upon themselves to generate systems of video feedback that became source material for artistic creation. Similarly, rather than using the smartphone to duplicate the repetitive images evidenced in social media feeds where many still and moving images captured on smartphones subsist, I chose to turn the smartphone camera on itself in the hope of generating novel forms.



Figure 7: Justin Harvey, *Eye of the Beholder* (2015), video still.

The aforementioned icons that appear within the user interface of the iPhone's camera application explicitly indicate the triggering of control parameters of both focus and exposure, whether by the user or by the algorithms governing the automatic settings of the camera.<sup>83</sup> Consequently, as mentioned, the moments when the artist and the algorithm reassert respective control over the shape of the feedback are visible within the artwork. With *EOTB*, my choices to intervene in the flow of feedback were attempts, at first, to generate a recognisable shape within the feedback and later to regenerate the form of the blinking eye. In the case of the algorithm, it was attempting to produce an image as close as possible to ideal parameters of focus and exposure programmed into the software. The result is an explicit expression of the interaction between artist and algorithm within the context of a digital video feedback loop. The appearances of these icons or symbols can be seen to represent two separate but related struggles: the struggle of artists, both in the early days of video and today, to harness video in efforts to expand human consciousness, and the struggle for control that occurs during the creation of images more generally in a contemporary context where we increasingly rely on algorithms to shape the way we perceive the material world. McLuhan may have seen this as positive progress for media technology, freeing up more time for us to educate ourselves and come together under God. My concern is that it has become far simpler to surrender the struggle and to confer increasing control onto the countless algorithms that govern all type of machines that extend our bodies and minds into the world. The dangers of deferring to the decisions of predetermined algorithmic equations, in my view, are twofold: firstly, that we nourish a false sense of control over the perilous contingencies of the world; and secondly, as our continued existence on this planet grows ever more tenuous, that we neglect our creative capacity to overcome the challenges we face as a species until it is too late to create a new vision of the future.

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<sup>83</sup> The software within the iPhone camera surveys the image for differences in contrast to find the sharpest focus, and differences in brightness for best exposure averaged across highlights, mid-tones and shadows. The algorithm is responding to multiple mathematical readings from the sensor in order to calculate how to create the best possible image in terms of sharp focus and ideal exposure for that particular scene. Based on predetermined ideals of both focus and exposure, the software signals the hardware to adjust the physical lens accordingly. There is an incredible amount of feedback being generated and acted upon within the camera, in incredibly minute periods of time, within the context of a self-referential feedback loop. This process mirrors closely the way that consciousness develops in human beings. In chapter 3 I expand on this metaphor in detail when I analyse the artwork of Marc Fichou, along with my own work.

The disembodied blinking eye that emerges and then dissipates into the abstract feedback that comprises *EOTB* is an obvious symbol of human visual perception, leading viewers to consider the smartphone and the embedded camera as an extension of that vision. (fig. 8) That digital video feedback, created using a smartphone — a device that embeds both camera and video screen allowing users to perceive themselves in real time more readily than ever before — should produce the image of an eye seems uncanny. Some might think of it as a moment of synchronicity, in a Jungian sense, “during which we can consciously observe a ‘narrow’ example of unified wholeness.”<sup>84</sup> I interpret it, rather, as an undeterminable result of the intuitive manipulation of video feedback, a serendipitous result of dwelling in the state of pure duration.

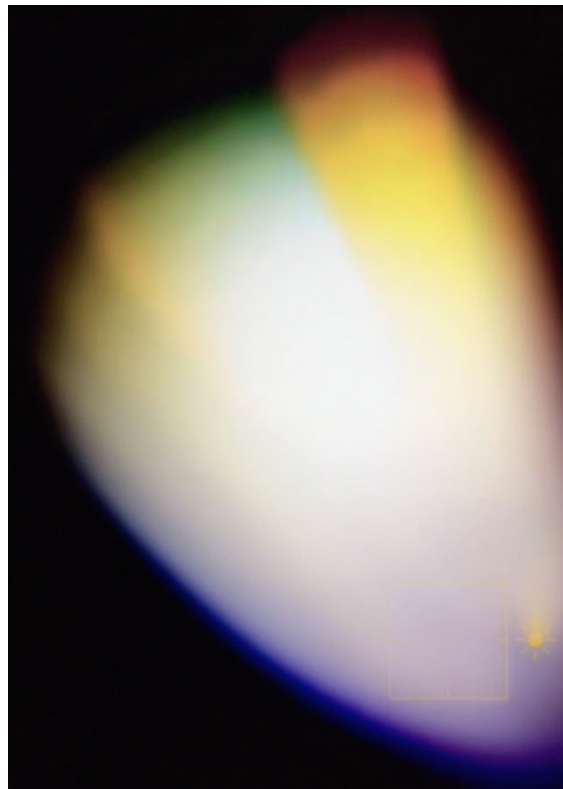


Figure 8: Justin Harvey, *Eye of the Beholder* (2015), video still.

In *Time and Free Will*, Bergson distinguishes between two aspects of consciousness with respect to the perception of time. One is pure duration, heterogeneous and indivisible: a continuity of perception where moments permeate one

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<sup>84</sup> Angeliki Yiassemides, *Time and Timelessness: Temporality in The Theory of Carl Jung* (London: Routledge, 2014), 47.

another, “confused, ever changing and inexpressible.”<sup>85</sup> The other, in stark contrast, is homogeneous and divisible as a result of pure consciousness coming into contact — through the various modes of human perception, of which vision is one — with states of the external, material world.<sup>86</sup> These moments of contact create sensations, thoughts and emotions that become connected in our mind to particular configurations of things in the homogenous space of the external world, so that “little by little, our sensations are distinguished from one another like the external causes that gave rise to them.”<sup>87</sup> This aspect of consciousness caused through the accumulation of relations is “clear and precise,” giving us a sense of control over the world outside of ourselves, but leading to the erroneous perception that time is naturally partitioned rather than enduring and indivisible.<sup>88</sup> *EOTB* can be read as a metaphor for the tension that exists between these two states, where the swirling, amorphous, indivisible patterns of feedback represent the pure duration of consciousness and the focus and exposure icons represent the desire for control over the material world. This need for control invokes the perceptive eye, solidified in order to interpret the material world.

As an extension of human vision, video technology contributes to a sense of time as divisible, used to more clearly define things in the material world in order that they may be more fully understood and controlled. The falling away of the eye in *EOTB* suggests that this technological extension of perception, although it is useful in many ways, might not reflect the fullness of reality, arguing via metaphor for the benefit of disengaging with it and the mechanised understanding of time it reinforces, at least for a time, in favour of a reconnection to the swirling flow of consciousness in order that we may consider new ways to shape it. That the icon representing the autofocus and exposure functions of the camera is the last to be seen within the work signals the artist’s acquiescence in relegating control over these functions to machines. With this in mind, *EOTB* also becomes a lament for the inability of artists in the early years of video to destabilise the dominance of the industrial entertainment complex that continues to divide time into predictable and discrete portions that we readily consume.

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<sup>85</sup> Bergson, *Time and Free Will*, 129.

<sup>86</sup> Bergson, 128.

<sup>87</sup> Bergson, 127.

<sup>88</sup> Bergson, 129.

In this chapter I have shown how ideas gleaned from Norbert Wiener's scientific theories of communication and control, Henri Bergson and Carl Jung's philosophical and psychological theories of consciousness and time, and Marshall McLuhan and Gene Youngblood's theories advocating for the artistic use of video to impact human consciousness influenced the work of artists who employed video feedback in the 1960s and 1970s. I argued that these artists regarded video as an extension of human consciousness and used video feedback to create work that challenges notions of consciousness and time as homogenous and divisible. Dan Graham and David Hall produced artworks that provoked viewers to reconsider their conscious perception of time through the medium of video. Eric Siegel and Peter Donebauer produced artworks that detune viewers from usual modes of experiencing video by presenting abstract ruminations on creativity, time and consciousness. Finally, I showed how my own artwork, *Eye of the Beholder*, drawing on similar concerns as those above, argues for an appreciation of the creative capacity of video feedback as a metaphor for Bergson's pure duration. In the following chapter I broaden my definition of video feedback to encompass the practices of artists in the 1990s and 2000s who were addressing the transformation of video from analogue signals to digital code, and show how the resulting artworks, along with my own, reflect the indivisibility of time.

## CHAPTER 2

### The Glitch, the Cut and the Curtain

In this chapter I argue that artists working with various forms of feedback in the 1990s and 2000s extended the work of the artists discussed in the previous chapter to contribute to an appreciation of the lived experience of time as indivisible. I outline the context in the final decade of the twentieth century, in which broadcast television had begun to give way to digital video and the internet became widely available, and explain how the consequential digitisation of culture became a significant catalyst for artistic investigations as the analogue video signal was translated into digital code. I discuss the emergence of glitch art, which, broadly described, entails the interruption of digital code to provoke an aesthetic that has come to represent concepts of digital accident, error and malfunction. Instead of the direct and extended video feedback loops used in the early days of video, glitch artists themselves become part of the feedback loop inherent in experimentation with the manipulation of compressed digital video files. Employing Mark Hansen's revisioning of Bergson's philosophy for the digital age, I argue that a selection of artworks that engage the technique known as datamoshing subvert the hard cut of video to reflect a Bergsonian notion of time. Finally, I analyse my artwork, *Curtain*, made using a combination of direct video feedback, glitching techniques and digital post-production processing, and show how it questions the possibility of a discernible present moment.

#### 2.1 The Rise of Digital Media

The advancement of artists' attempts to manipulate and control the video image can be traced through the development of video synthesis technologies from the 1960s through



to the 1980s and beyond.<sup>1</sup> By the last decade of the twentieth century the drive for complete control of the video image had been realised, as analogue video gave way to digital video and the widespread availability of digital video post-production software. Much has been written about the transition from analogue to digital video, but it suffices here to say that whilst analogue video relied on a constant electronic signal, digital video entails the abstraction of moving images into numerical data.<sup>2</sup> Digital video is one of a number of digital media objects that media theorist Lev Manovich termed *new media* in his seminal text, *The Language of New Media* (2001). According to Manovich, one of the five key tendencies or principles of new media objects, which now include almost all types of media, is that due to their representation as digital code, they are highly variable or adaptable. So, whilst the analogue video signal was already variable in terms of the ability to manipulate it with video synthesisers, with the move to digital video “the range of variations is greatly expanded.”<sup>3</sup> It is toward digital video that artists would turn in the last decade of the twentieth century to address their concerns that grew out of the cultural context existing at the dawning of the digital age. Manovich, writing at the turn of the century, describes the state of the world in which digital media had come to supplant most analogue media formats. The fall of the Berlin Wall — a longstanding symbol of the Cold War — in 1989 and the dissolution of the Soviet Union in 1991, amongst other events, had led to a world wherein the tensions that had existed for decades had given way to different concerns. Manovich describes “a triumph of consumerism, commercial culture (based on stereotypes and limited clichés), megacorporations that lay claim to such basic categories as space, time and the future... and ‘globalisation.’”<sup>4</sup> This context had evolved not least of all due to the fact that by the mid-1990s the internet had become available to the Western middle class and by the turn of the century it was clear that the “computerisation of culture [would] eventually transform all of it.”<sup>5</sup>

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<sup>1</sup> For an exhaustive discussion on this, see Kathy High, Sherry Miller Hocking and Mona Jimenez, eds., *The Emergence of Video Processing Tools: Television Becoming Unglued* Vol. 2 (Bristol: Intellect, 2014).

<sup>2</sup> See for example Jihoon Kim, *Between Film, Video, and the Digital: Hybrid Moving Images in the Post-Media Age* (London: Bloomsbury Academic, 2014); Yvonne Spielmann, *Video: The Reflexive Medium* (Cambridge, MA: MIT Press, 2007); Catherine Elwes, “Visible Scan Lines: On the Transition from Analog Film and Video to Digital Moving Image,” *Millennium Film Journal* 58 (2013): 58–63.

<sup>3</sup> Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001), 133.

<sup>4</sup> Manovich, 5.

<sup>5</sup> Manovich, 6.

This transformation of culture is analysed in detail by sociologist Manuel Castells, who describes a new paradigm where “the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power, and culture.”<sup>6</sup> According to Castells, in a network society there is immediate access to events no matter where they are situated around the world, and these events can be reordered depending on the socially contextualised desires of the person accessing them. Distance is no longer an impediment to knowledge of events in the world and the original chronology of events is susceptible to rearrangement due to individual control over the choice of what segment of recorded time one might access at any given moment.

The digital regime, however, even given its inherent characteristics of variability and interactivity, does not fundamentally change the way that video technology, in its segmentation of intervals of recorded time, contributes to an understanding of time as divisible. In fact, it intensifies this tendency since digitisation affords a higher level of control over the moving image. With more control over patterns of production of video, I suggest that we perceive the possibility to divide time in ever increasing efficiencies. Castells is useful here in his explanation of the media generally as “a system of feedbacks between distorting mirrors: the media are the expression of our culture, and our culture works primarily through the materials provided by the media.”<sup>7</sup> In the network society more specifically, media — digitised and networked — becomes a new system of multimedia that captures almost every form of cultural expression, generating what Castells calls “real virtuality”:

*a system in which reality itself (that is, people’s material/symbolic existence) is entirely captured, fully immersed in a virtual image setting, in the world of make believe, in which appearances are not just on the screen through which experience is communicated, but they become the experience. All messages of all kinds become enclosed in the medium because the medium has become so comprehensive, so diversified, so malleable that it*

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<sup>6</sup> Manuel Castells, *The Rise of the Network Society, Volume 1: The Information Age — Economy, Society and Culture* (Hoboken, NJ: John Wiley & Sons, 2009), 500.

<sup>7</sup> Castells, 365.

absorbs in the same multimedia text the whole of human experience, past, present, and future.<sup>8</sup>

It is this context of increasing immersion in virtual digital images that artists found themselves in the last decade of the twentieth century, as the transference of human experience onto the screen worked to promote an increased identification with multimedia *as* experience.

## 2.2 Bergson for the Digital Age

In *Time and Free Will*, Bergson describes pure duration as “nothing but a succession of qualitative changes, which melt into and permeate one another, without precise outlines, without any tendency to externalise themselves in relation to one another, without any affiliation with number.”<sup>9</sup> According to Bergson, we only identify conscious states as multiple and distinguishable from one another retrospectively. Through hindsight, rather than perceiving a continual flow, we manage to distinguish a lineage of multiple states through which we have passed. Each of these states is allocated finite beginnings and endings through its relation to distinct external phenomena. Bergson claims, however, that “In reality, none of them do begin or end; they all dove-tail into one another.”<sup>10</sup> I argue that because we use video to record and replay segments of lived duration that represent distinct beginnings and endings, it tends, as an extension of our consciousness, to reinforce this identification with an erroneous notion of time as divisible. Artists who engage with the shaping of video feedback create work that negates this tendency and instead support Bergson’s position that time as experienced consciously cannot be divided.

New media theorist Mark Hansen demonstrates how media artists attempt to reclaim Bergson’s idea of the body as a “center of indetermination in an acentered universe.”<sup>11</sup> He takes up Bergson’s understanding of the world as “an aggregate of

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<sup>8</sup> Castells, 404 (emphasis in original).

<sup>9</sup> Bergson, *Time and Free Will*, 104.

<sup>10</sup> Henri Bergson, *The Creative Mind: An Introduction to Metaphysics*, trans. Mabelle L. Andison (New York: Philosophical Library Inc., 1946), 192.

<sup>11</sup> Mark B. N. Hansen, *New Philosophy for New Media* (Cambridge, MA: MIT Press, 2004), 3.

images,” and of conscious bodily perception as a process of subtraction such that we isolate certain aspects of these images, and reworks it for the digital age.<sup>12</sup> In Bergson’s words:

Here is a system of images which I term my perception of the universe, and which may be entirely altered by a very slight change in a certain privileged image — my body. This image occupies the center; by it all the others are conditioned; at each of its movements everything changes, as though by the turn of a kaleidoscope.<sup>13</sup>

Hansen describes how in *Cinema 1: The Movement Image* (1983), philosopher Gilles Deleuze identified a correspondence between Bergson’s concept of the image and cinema. However, in equating the cut between cinematic shots and the framing of images that it entails with the body as a centre of indetermination, Deleuze discards Bergson’s embodied affection and replaces it with an enframed technological image, with the viewer as a passive receiver. In his effort to reclaim Bergson’s embodied affection as a theoretical basis to explore media art, Hansen argues, following Manovich, that digital media — as the processing of information in time — makes the image obsolete, thereby turning the viewer into an active user rather than passive perceiver. This conception of the image reworks Bergson’s idea of the universe of preconstituted images into digital formlessness, requiring enframing by consciousness, a context wherein “rather than selecting preexistent *images*, the body now operates by filtering *information* directly and, through this process, *creating* images.”<sup>14</sup> I would not argue against the notion that our body — as a privileged centre of indetermination — maintains the capacity to perceive the images of the world selectively and respond creatively to them, but I do not agree that in our usual experience of digital imagery we filter the raw digital information that constitutes them. Even though digital images derive from streams of numerical code, we most commonly see them as whole pictorial representations on screens. It is only when the means of instantiation of the digital image is interrupted, through an error or manipulation of code or a malfunction of hardware for example, that we notice these means.

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<sup>12</sup> Hansen, 4.

<sup>13</sup> Bergson, *Matter and Memory*, 25.

<sup>14</sup> Hansen, *New Philosophy for New Media*, 11 (emphasis in original).

Hansen's argument relies on his adoption of biologist, philosopher, cybernetician, and neuroscientist Francisco Varela's combination of Edmund Husserl's phenomenology with discoveries from the field of neuroscience, an approach he terms neurophenomenology. Varela correlates "the phenomenological category of affectivity with the temporality of the neuroprocessing underlying the emergence of the perceived now," thereby linking our conscious experience of time with "the more or less fixed 'hardware' of our neural architecture and its sensorimotor embodiment."<sup>15</sup> According to Hansen, Varela, through his analysis,

furnishes the mechanism for machine time to affect time-consciousness: as constitutive elements of what we might call a microphysical temporal object, the elementary events... of a machinic event, which are subperceptual, can trigger neural processes at this same microphysical scale, which are themselves likewise subperceptual. Yet rather than yielding a direct inscription of the microphysical temporal object, this process serves to trigger an endogenous response that Varela... likens to a process of framing.<sup>16</sup>

This understanding of an endogenous response of framing, which arises from within the body as an indirect response to the triggering of neural processes by digital processes, allows for the reclamation of Bergson's embodied affection, specifically in the perception of digital imagery. Hansen uses artist Bill Viola's work *Quintet of the Astonished* (2000) as an example of the way digital video can be used to highlight that which is indiscernible through the usual means of perception, drawing attention to the body as a centre of indetermination.

Viola's process involved filming human actors at high frame rates and then digitising the film rushes and slowing playback so that minute incremental changes in bodily expressions can be discerned. In this way, as Hansen puts it, "Viola's aesthetic deprivileges the technical frame... in favor of the framing activity of a body affectively open to the nonlivable, nonactual, and imperceptible."<sup>17</sup> This may be true, but not

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<sup>15</sup> Hansen, 250.

<sup>16</sup> Hansen, 251.

<sup>17</sup> Hansen, 268.

because of the simple fact that the work is digital, rather it is because digital technology allowed Viola to slow the high frame rate footage down to such an extent that the bodily movement of the actors were completely smooth. In addition, I would argue that this kind of deprivileging of the technical frame occurs only when there is something out of the ordinary represented in the video image, such as the extreme slowing down of time, or the appearance of a glitch. Given the ordinary, error-free functioning of digital video technology, reality is recorded and played back seamlessly and accurately. We no more enframe a DVD version of a film than we do a VHS copy of the same film, at least in terms of the content represented within the moving image. It is only when the image is manipulated to subvert the direct representation of reality that we expect from it that we are likely to be provoked into the kind of creative enframing that Hansen proposes. The otherwise faultless playback of digital video most often continues to divide time just as efficiently as that of its outdated analogue equivalent.

Glitch art practices and aesthetics function to subvert the otherwise seamless functioning of multimedia technology, including digital video, allowing for the kind of creative enframing put forward by Hansen. The works of glitch artists problematise the real-time execution of digital code, the capitalist structures underlying the distribution and use of digital technologies of communication, and our personal relationship to such technologies. Through manipulations of digital video that entail various forms of feedback that draw attention to the underlying processes of digital video, glitch artists bring into question the passive reception of and identification with the representations it delivers. In the following section I provide a brief outline of the growth of a diverse field of glitch practices and the use of feedback loops within it. Then I analyse artistic practices, drawn together under the term *glitch* that developed throughout the 1990s and 2000s. In doing so, I contribute new readings of specific works of glitch art that reveal the way in which they confront the idea of time as divisible and instead gesture toward an understanding of time akin to Bergson's notion of duration.

### 2.3 The Aesthetics of Failure

In the 1990s, the band Oval found and forced errors in compact discs to create music that composer Kim Cascone dubbed “post-digital.”<sup>18</sup> Used interchangeably with glitch, a term that he attributes to music journalists of the era, Cascone described an “aesthetics of failure” that critiques ideas of control embedded within the rapidly advancing digital audio technologies of the time.<sup>19</sup> According to Cascone, artists including Ryoji Ikeda, Mika Vainio, Carsten Nicolai and Nobukazu Takemura were reacting to “working in environments suffused with digital technology,”<sup>20</sup> and that their work revealed these digital tools to be as flawed as the humans who conceived them. Whilst this statement may be considered somewhat of a truism, and the concept of failure is nothing new in contemporary art, what was new in the work of artists working with glitch was that they were working with digital media.<sup>21</sup>

Cascone cites the concept of the “background” with reference to glitch music, “comprised of data we filter out to focus on our immediate surroundings.”<sup>22</sup> It is the background processes of digital audio production that musicians and artists were exploiting to create these post-digital compositions.<sup>23</sup> Similarly, it was toward the background of the internet and digital still and moving images that visual artists, including Ant Scott, Curt Cloninger, Shay Moradi, Jon Satrom, Nick Briz and Mark Amerika, were also turning to explore the creative possibilities to be found there. Cascone describes a “cultural feedback loop,” where artists could, via the internet, easily share their tools and processes with others who could experiment with them, extend their ideas and share them back.<sup>24</sup> In this way, visual glitch aesthetics began to develop alongside glitch music and ideas of failure, error and malfunction continued to underpin the artwork that resulted. In addition to exploiting glitches in digital audio technologies, artists such as Joan Hemskerk and Dirk Paesmans (as JODI), Paul B. Davis, Cory Arcangel, Jon Cates and Rosa Menkman began to exploit found and forced

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<sup>18</sup> Kim Cascone, “The Aesthetics of Failure: ‘Post-Digital’ Tendencies in Contemporary Computer Music,” *Computer Music Journal* 24, no. 4 (2000): 12.

<sup>19</sup> Cascone, 12.

<sup>20</sup> Cascone, 12.

<sup>21</sup> See for example Lisa Le Feuvre, ed., *Failure* (Cambridge, MA: Whitechapel Gallery/MIT Press, 2010).

<sup>22</sup> Cascone, “The Aesthetics of Failure,” 13.

<sup>23</sup> For a detailed discussion of the context in which glitch music emerged see Caleb Kelly, *Cracked Media* (Cambridge, MA: MIT Press, 2009).

<sup>24</sup> Cascone, “The Aesthetics of Failure”, 17.

errors in digital mediums such as computer game platforms, and still and moving image file formats. Through tampering with digital still and moving image files at varying levels of abstraction, artists disrupt the way they are instantiated, creating deformed or glitched versions of our increasingly digitally mediated reality.

In her survey on the field of glitch, *The Glitch Moment[um]* (2011), artist and theorist Rosa Menkman illuminates a multifaceted field of practice in which “glitch artists reveal the machine’s techné and enable critical sensory experience to take place around materials, ideologies and (aesthetic) structures.”<sup>25</sup> Menkman identifies three strands of practice used in glitching based on three types of noise artifacts: signal corruption, de/compression artifacts and feedback.<sup>26</sup> Signal corruption includes game modifications and other types of coded interventions. Compression artifacts are created through practices of misapplication and misuse of digital still and moving image files, such as the practice of datamoshing, discussed later in this chapter. Feedback, as we have seen, is a form of signal differentiation where the output of a system is fed back to itself as input. Menkman recognises that these demarcations are more slippery than rigid, discussing signal interruption at length and devising a detailed litany of specific compression aesthetics comprising the diverse field. She spends barely a paragraph, however, on feedback — an odd elision considering her creative output around this time that relied on the use of feedback in its making, which I discuss below.<sup>27</sup> This can be understood because although it is possible to easily describe signal corruption and compression artifacts and point to concrete examples, feedback is more difficult to categorise, and often used as one of numerous elements in complex technical set ups comprising live glitch performances. I turn towards the various manifestations of feedback within glitch practices shortly, but first I explain how it is that the glitch aesthetic failed to maintain its critical momentum.

Menkman describes the experience of glitch, its affect, as a “loss of (perceived) control,” introducing “tension into user intentions.”<sup>28</sup> If, as discussed above, digital

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<sup>25</sup> Rosa Menkman, *The Glitch Moment[um]* (Amsterdam: Institute of Network Cultures, 2011), 33.

<sup>26</sup> Menkman, 15.

<sup>27</sup> Menkman, 26.

<sup>28</sup> Menkman, 31.



technology is perceived as providing an excess of control to the user, the glitch interferes with this presumption of control, forcing us to question where in fact the control of digital media lies: with the user or with the machine. Whereas a weak or disrupted analogue video signal creates an excess of noise in the image, a disruption in a digital flow of information normally results in a complete loss of a digital image. The glitch, being situated somewhere between function and failure, has come to represent the failure of digital technology to fail completely, with glitch practices entailing the aestheticisation of digital errors. Artist and theorist Daniel Temkin proposes that although glitch artists are often assumed to use the idea of error as their muse, “when it comes to actual practice, there’s often not much glitch in glitch art.”<sup>29</sup> He argues that “the tension in the form does not come from risk of damage or failure, but from the surrender of the image to an unpredictable system, the collaboration with the machine.”<sup>30</sup> It is difficult to disagree with Temkin that whilst glitch art may have arisen out of the exploitation of digital errors, accidents and malfunction with a view to critiquing the context in which they appeared, practice within the field has more to do with the disruption of the logic of digital systems: glitch artists increasingly enacted knowing interventions into the way digital technologies function.

Menkman distinguishes cool or ‘critical glitches’ from hot or ‘commodified glitches’, positioning commodified glitches as superficial or superfluous, and critical glitches as disruptive of the accepted conditions in which we digitally find ourselves.<sup>31</sup> She laments the fact that glitch aesthetics have been rapidly absorbed into popular media culture. Indeed, the glitch aesthetic was quickly absorbed by the entertainment industry, appearing in advertising, music videos, feature films and design software presets.<sup>32</sup> There has been a failure of the aesthetics of failure to sustain a critical attack on the various technological and capitalist drives that Menkman maintains force us to frame ourselves in increasingly restrictive ways. Following Menkman, artist and theorist

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<sup>29</sup> Daniel Temkin, “Glitch & Human/Computer Interaction,” *Journal of Objectless Art* v.1.1 (2014), accessed 30 May, 2015, <http://nooart.org/post/73353953758/temkin-glitchhumancomputerinteraction>.

<sup>30</sup> Temkin, “Glitch & Human/Computer Interaction.”

<sup>31</sup> Menkman, *The Glitch Moment[um]*, 36.

<sup>32</sup> Well-known examples include the use of Oval’s track “Textuell” in the television commercial for Giorgio Armani’s Acqua di Giò (1997), Kanye West’s music video for *Welcome to Heartbreak* (2009), and The Wachowski’s film, *The Matrix* (1999).

Jon Cates terms the mainstreaming of glitch practices “post-glitch,” calling for artists to “trace escapes” from commodified glitch techniques and aesthetics, advocating for the use of novel processes in the creation of glitch art and a reorientation in its conceptualisation.<sup>33</sup> What I attempt here, then, is a reorientation in the conceptualisation of glitch practices in order to draw out the ways in which particular works that engage with video feedback support my central argument that artists using video feedback contribute to an understanding of time as indivisible.

## 2.4 Feedback in Glitch Art

A discussion of feedback in glitch art requires a broader definition of video feedback than the one I have used up to this point. Although artists continue to use direct and indirect video feedback loops in the production of glitch aesthetics, the arrival of digital technology affords an extension of the idea of a feedback loop. Instead of the isolated direct video feedback loops of early artistic experiments with analogue video, glitch artists experiment with novel systems of indirect video feedback that incorporate multiple channels of analogue and digital video processed in any number of ways. Instead of extended feedback, in which viewers are placed inside a delayed video loop, artists themselves become part of a creative feedback loop whereby through trial and error in methods of digital manipulation they produce artworks that exploit the way digital video is compressed and shared. I claim that each of these methods expands on the processes of artists discussed in chapter one, resulting in work that reinforces an idea of time akin to Bergson’s duration. I will proceed firstly with a discussion of two artworks by Rosa Menkman to support my claim: one produced via the digitisation of direct analogue video feedback, and the other employing feedback as part of a variety of processes in the production of a live video performance.

Menkman’s *Radio Dada* (2009) incorporates direct analogue video feedback as its source material, captured by her as a digital video file. (fig. 9) She then glitched the video by changing the format of the file, rendering it as a series of GIFs.<sup>34</sup> The work

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<sup>33</sup> Jon Cates, “PØST-GL!TCH,” *Journal of Objectless Art* v.1.2 (2014), accessed 30 May, 2015, <http://nooart.org/post/81334324619/catespostglitch>.

<sup>34</sup> GIFs are an image compression format used for small animations and low-resolution video clips.

presents a multitude of chaotic, abstract pixelated colour and movement set to music composed by Extraboy (musician Anders Carlsson). In her use of feedback here, Menkman appropriates the analogue experiments of pioneering video artists Eric Siegel, Peter Donebauer, and Steina and Woody Vasulka, but shapes it in ways only possible with digital technology. Along with the overt reference to the Dada movement, she pays homage to the use of the GIF image format in online glitch art communities when this format was the only way artists were able to share their glitch experiments via the internet. Those familiar with direct video feedback will recognise what were originally smooth, slowly evolving blobs of analogue video feedback translated into stuttering, pixelated digital data. In this way, *Radio Dada* provides an exemplar for other glitch artists in the shaping of video feedback using digital post-production processes and more specifically, a decisive visualisation of the digitisation of analogue video feedback.

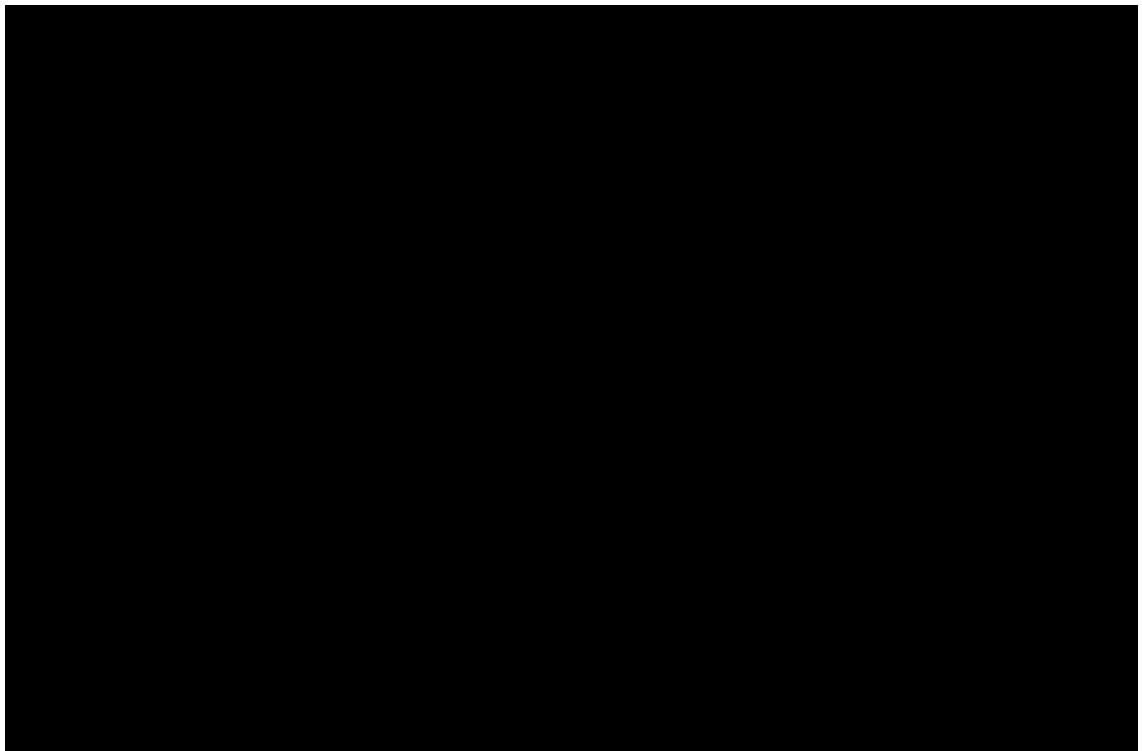


Figure 9: Rosa Menkman, *Radio Dada* (2009), video still of online documentation, <https://vimeo.com/2321833>.

For *The Collapse of PAL* (2010), (fig. 10) Menkman used analogue signals, various compression formats, glitches and digital feedback artefacts in sound and video to create a narrative addressing the discontinuation of the Phase Alternate Line colour

encoding system.<sup>35</sup> The original work, performed at the GLI.TC/H 2010 conference in Chicago, begins with distorted live video of Menkman's face looking out at the audience that dissolves into a scene of rippling water overlaid with live text narrating Menkman's lament for the discontinuation of PAL. Her face appears again, a spectral witness, before dissolving again into the watery scene. This then changes to warped footage shot from trains and cars of rural landscape passing by and tree-lined roads disappearing into the horizon of history.

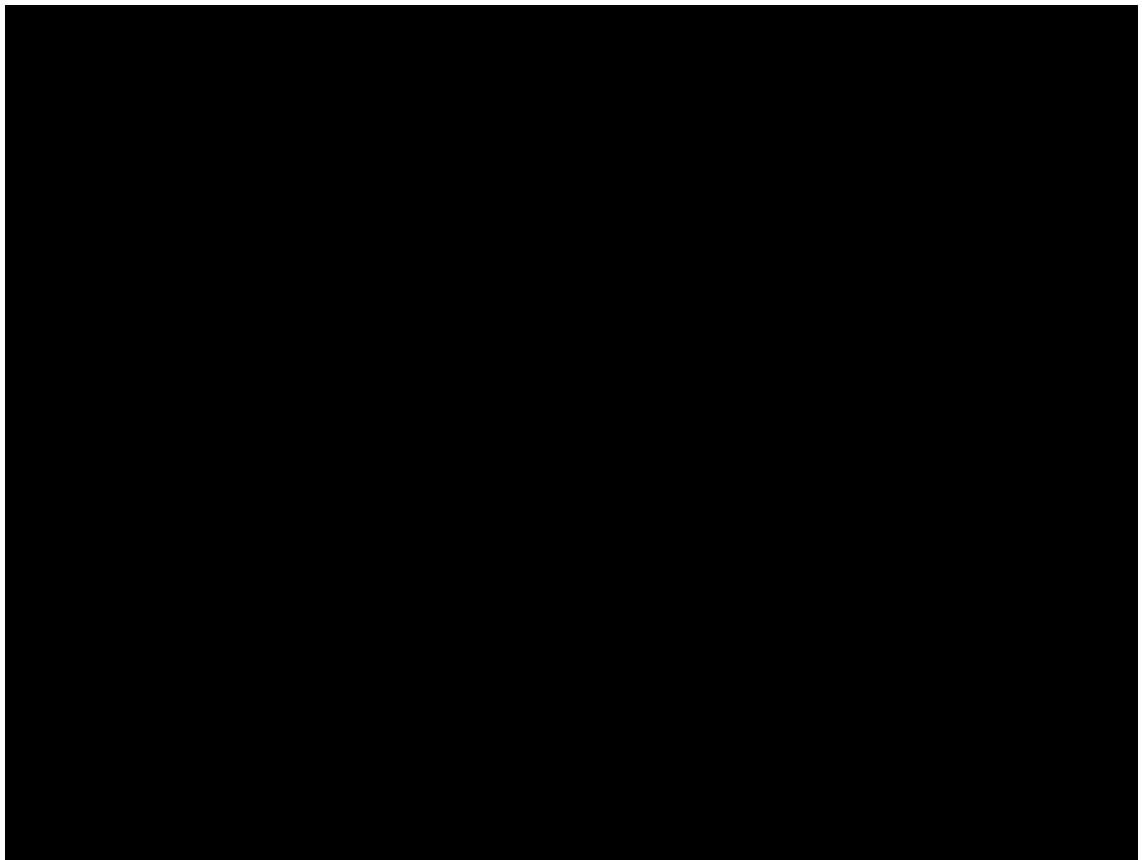


Figure 10: Rosa Menkman, *The Collapse of PAL* (2010), video still of online documentation, <https://vimeo.com/12199201>.

Menkman's distorted video image in *The Collapse of PAL* represents the 'angel of history', as described by Walter Benjamin in his essay, "Theses on the Philosophy of

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<sup>35</sup> Phase Alternate Line (PAL) is a colour encoding system that was used for analogue television broadcast across much of the world up until 2011, when it was discontinued in favour of DVB (digital video broadcasting) standards.

History" (1940).<sup>36</sup> Benjamin's notion derives from his description of a painting he owned by Paul Klee, *Angelus Novus* (1920). He imagines the depicted angel being blown by the storm of progress into the future, unable to look away from the piled-up wreckage of the past.<sup>37</sup> Menkman's text echoes Benjamin's words as she describes a mounting pile of debris growing skyward. It seems clear, then, that through the mix of analogue and digital processes, and the appropriation of Benjamin's angel of history, that *The Collapse of PAL* deals overtly with obsolescence. Media theorist Jussi Parikka considers *The Collapse of PAL* as an overly nostalgic "critique of rationalism and progress," and he questions the voracity of the work as critically engaged in media archaeology.<sup>38</sup> Whilst it is true that glitch art, including *The Collapse of PAL*, often displays superficial yearnings for obsolete signals and formats, here Menkman implicates herself as not only a nostalgic witness to the passing of PAL into obsolescence, but as fully complicit with the rationalism of technological progress in her use of the digital technologies she employs to perform the work. My purpose here, however, is not to defend this critical aspect of *The Collapse of PAL*, but to propose an alternative reading, or rather an additional layer of meaning that has been overlooked, one that goes toward the central argument of this thesis.

In Benjamin's description of his angel, on which Menkman's is modelled, he states: "Where we perceive a chain of events, he sees one single catastrophe which keeps piling wreckage upon wreckage and hurls it in front of his feet."<sup>39</sup> For me, as for Henri Bergson, this one single catastrophe is the division of time into space that is mirrored by the division of time into discrete intervals of video. Benjamin's angel stands outside of

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<sup>36</sup> Walter Benjamin, "Theses on the Philosophy of History," in *Illuminations*, trans. Harry Zohn, ed. Hannah Arendt (New York: Harcourt Brace Jovanovich, 1968; New York: Schocken Books, 2013), 253–264. Citations refer to the Schocken edition.

<sup>37</sup> "His eyes are staring, his mouth is open, his wings are spread. This is how one pictures the angel of history. His face is turned toward the past. Where we perceive a chain of events, he sees one single catastrophe which keeps piling wreckage upon wreckage and hurls it in front of his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. This storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. This storm is what we call progress." Benjamin, "Theses on the Philosophy of History," 257–258.

<sup>38</sup> Jussi Parikka, "Media Archaeology of Signals (Transmediale 2011)," *Cartographies of Media Archaeology* (February 2011), accessed May 7, 2015, <https://mediacartographies.blogspot.com/search?q=menkman>.

<sup>39</sup> Walter Benjamin, "Theses on the Philosophy of History," 257–258.

the time of cause and effect and so does not perceive time as divided. Instead, he sees a wholeness, albeit materially represented by layers of detritus, all representing arbitrary intervals of an indivisible duration accumulating in memory from which he has trouble disengaging. For Menkman, the catastrophe is the division of the analogue signal into digital code, the loss of the PAL signal, “only to survive as a trace” in the 1s and 0s of binary code.<sup>40</sup> But what I see throughout *The Collapse of PAL* is Menkman’s angel as a witness to constant motion; duration is represented metaphorically as an inseparable mix of analogue and digital, each depicting the past and future of television broadcast, indivisible as the traces of one survive in the other. Menkman’s subtle use of video feedback here is but one element in a broad toolkit of processes whereby she not only draws attention to issues around technological obsolescence but also puts forward an understanding of time as an indivisible temporal flow, regardless of the technology through which we perceive it.

Menkman’s artworks, via her use of direct feedback as source material for *Radio Dada* and by positioning herself within complex loops of analogue and digital video feedback in *The Collapse of PAL*, build on the work of the pioneers of video feedback, translating their processes into the digital context. Her theoretical investigations into the glitch movement reveal a strong affinity between the concerns and processes of glitch artists and those of artists who worked with video feedback in the 1960s and 1970s. In the next section I demonstrate how artists’ use of datamoshing, one of the hallmark practices of digital détournement within the field of glitch, reflect the notion of time as indivisible by muddying the hard cut of video that ordinarily indicates its division.

## 2.5 Datamoshing: Muddying the Hard Cut of Video

The practice of datamoshing entails the deletion, duplication or replacement of specific frames within a compressed digital video file, resulting in the bleeding of movement and

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<sup>40</sup> “The angel of history had television. She witnessed the termination of PAL, and when the PAL signal was muted, its chance to clarity [sic] smothered, a brutal but silent execution had taken place... In front of her she sees a pile of debris growing skyward. Connections that were just not good enough. They are now left behind to loose [sic] their significance. PAL slowly vanished in these eerie ruins only to survive as a trace, a memory left onto other connections, crashed and collided. This is where PAL’s history can still be found, a lost signal.” Rosa Menkman, *The Collapse of PAL* (2010).

colour from one frame of video into subsequent frames, an effect known as ‘pixel-bleeding’. In compressed digital video files, rather than storing all of the information for each frame of the moving image, certain frames are completely stored (intra-coded, or I-frames), whilst others (predicted and bi-predicted, or P-frames and B-frames) contain data describing only the difference between itself and either the preceding or succeeding frame. Changing, repeating or completely deleting certain I-frames forces the colour and/or movement information held in P- and B-frames to be applied to unintended frames. The most common datamoshing practices include the removal and/or replication of specific frames of a digital video file using video encoding software and the purposefully incomplete download of a digital video file using the BitTorrent protocol.<sup>41</sup> The first method affords the most control over the effect. Artists use video editing software such as Avidemux, which has the ability to identify I-, P- and B-frames, to enact precise edits in order to blend colour and movement from specific shots with others.<sup>42</sup> The second method involves the appropriation of an incomplete digital video file downloaded using the BitTorrent protocol via peer-to-peer sharing networks. The BitTorrent protocol allows users to simultaneously upload and download digital video files by connecting with a network of home computers each hosting an identical file. Each file is segmented into pieces that can be downloaded in random order. By interrupting the download, the file is missing random pieces of the video file, including both I- and P-frames, leading to the appearance of pixel-bleeding effects when the file is played back as decompression algorithms attempt to reconstruct the incomplete digital file.

Both of these methods involve the employment of feedback. The first method entails a process of trial and error, so that after the artist performs a manipulation, they gauge how it has affected playback of the file and future manipulations are performed with this understanding in mind. In this way the artist is positioned in a feedback loop responding to the way the digital video file acts based upon their manipulations. The

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<sup>41</sup> Datamoshing can also be achieved through the direct editing of the binary code of a digital video file using hex editing software, which allows for manipulation of the fundamental binary data that constitutes a computer file. This method affords the least control to the artist and the possibility of destroying the integrity of the file is high as the deletion of certain lines of code renders it unplayable.

<sup>42</sup> A datamoshed file may play back differently, with varying effects depending on the software player used for playback and the specific decoding algorithms used.

second method relies on the complex processes of feedback inherent in the decentralised sharing of files whereby a piece of software, known as a BitTorrent client, constantly monitors the swarm for viable packets to download. In addition, even though the file is already missing random frames, artists make linear cuts using a process of trial and error to assert control over the order of playback. In both cases, in the resultant datamoshed video moments of time bleed into each other and hard cuts are often non-existent, denying the divisions of time these cuts would normally create.

Media theorist Jihoon Kim argues that datamoshed video represents the transition of abstract aesthetics from analogue to digital video, where “the formal, technical, and aesthetic components of non-digital media are still at play in the operation of new media.”<sup>43</sup> He performs a comparative reading, drawing on post-medium discourses from art criticism, and post-media discourses within media theory, concluding that they both agree that the modernist idea of medium specificity no longer holds. Describing datamoshed video, and glitched video more generally, as “hybrid abstraction,” he expands on the common claim around glitch art, that it acts as an investigation into the underlying structures and functions of digital media. Ultimately, Kim argues that glitch videos “push the aesthetic of hybrid materialism in structural film and image-processing video further as they lead to the dynamic intersection of representational imagery and abstract form as the result of digital processing.”<sup>44</sup> Filmmaker and scholar William Brown and scholar Meetali Kutty position datamoshing as a practice of reworking digitally chaotic material, leading to a form of digital emergence: the creation of order from chaos. They adopt Bergson’s position that humans don’t experience time in discrete units, even though computers divide it, arguing that these differing temporalities of human and computer time “interpenetrate each other” in instances of datamoshing, providing for the conditions of the emergence of a new order from digital chaos.<sup>45</sup> Although they claim that “from the digital soup and swirling colours changing in time, patterns seem spontaneously to emerge, such that a

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<sup>43</sup> Jihoon Kim, *Between Film, Video, and the Digital: Hybrid Moving Images in the Post-Media Age* (London: Bloomsbury Academic, 2014), 19.

<sup>44</sup> Kim, 119.

<sup>45</sup> William Brown and Meetali Kutty, “Datamoshing and the Emergence of Digital Complexity from Chaos,” *Convergence* 18, no. 2 (2012): 171.



new aesthetic meaning occurs,” they do not hint at what that new aesthetic meaning might be.<sup>46</sup> Whilst the views of Kim and Brown and Kutty are useful in thinking through the practice of datamoshing as an artistic process, they each miss the significance of the pixel-bleeding aesthetic in terms of the way it works to destabilise the hard cut of video as a device for segmenting time.

Artists have mostly used datamoshing techniques to disrupt existent narratives from popular culture. Some artworks resulting from datamoshing display moving images that are so far abstracted from the original material that it is rendered unrecognisable, while others create more subtle distortions of well-known stories. Takeshi Murata datamoshed the comedy film *Caveman* (1981), the action film *Rambo: First Blood* (1982) and the vintage horror film *Mask of Satan* (1960) to make *Monster Movie* (2005), *Untitled (Pink Dot)* (2007) and *Untitled (Silver)* (2006) respectively. These works from Murata all display highly abstract, almost liquid aesthetics, nearly completely erasing all narrative elements from the films. For his *Video Compression Studies I–IV* (2007) Paul B. Davis datamoshed digital video files of Mathew Barney’s *Cremaster Cycle* (1994–2002) and Japanese wrestling matches resulting in a similar distortion of the source material into a mess of colours and movement. Looked at in isolation, these works seem to give credence to Brown and Kutty’s contention that the datamosh “lends itself to a spectacle of colour, with little or no narrative,” however there are other examples of datamoshing that suggest that this is not always the case.<sup>47</sup> Artists Douglas Goodwin and Rebecca Baron’s *Lossless* series (2008) and Connor McGarrigle’s *Bit Torrent Trilogy* (2011–2013) point to alternative readings of datamoshing beyond merely exposing chaotic ghosts in the machine. By forcing moments to extend over one another within shots and muddying the cuts that divide one shot from the next in well-known narratives, artists destabilise our identification with the division of time into discrete intervals. This is achieved through the provocation of the creative enframing, as proposed by Hansen, of the deformed representations of well-known narratives that result in the playback of the datamoshed digital video files.

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<sup>46</sup> Brown and Kutty, 173.

<sup>47</sup> Brown and Kutty, 169.

Goodwin and Baron's *Lossless #2* (2008) was compiled from portions of Maya Deren's influential 1943 black-and-white film *Meshes of the Afternoon* downloaded via the BitTorrent protocol. (fig. 11) Deren's film famously depicts a subjective dreamlike reality wherein a woman, having returned home and fallen asleep, experiences a series of variations of a loop of time in which she returns home to slightly altered scenarios, including encounters with other versions of herself and a mysterious figure in black with a mirror for a face. Deren is quoted as saying that *Meshes of the Afternoon* is an attempt to use film to reveal "the inner realities of an individual and the way in which the subconscious will develop, interpret and elaborate an apparently simple and casual incident into a critical emotional experience."<sup>48</sup> As a filmic representation of conscious or subconscious experience, or as I would argue some combination of the two, *Meshes of the Afternoon* does well in representing a coherent subjective state with the use of jump cuts and a progression of differentiated loops. However, this use of hard cuts to divide the events that the woman experiences into discrete intervals of time effectively divides duration into separate states.<sup>49</sup> Contrary to Deren's approach in this film, Bergson argues that there cannot be quantitative differences in conscious states: only qualitative differences: "states of consciousness, even when successive, permeate one another."<sup>50</sup> It is worth repeating his words quoted earlier when he says that pure duration is "a succession of qualitative changes, which melt into and permeate one another, without precise outlines, without any tendency to externalise themselves in relation to one another."<sup>51</sup> Goodwin and Baron's datamoshed version of *Meshes in the Afternoon* in *Lossless #2* brings the film closer to realising a subjectivity in line with Bergson's claims in the way that moments melt into each other: the woman's footsteps up a flight of stairs leave trails of grey, making it hard to define where one step ends and the next begins; a loaf of bread on the table morphs into a kind of tunnel and then a wall; and a panning shot of the living room becomes enlivened by the emergence of the form of the woman from the pixels making up the scene. Distinct moments blur from one to the next,

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<sup>48</sup> Sally Berger, "Maya Deren's Legacy," in *Modern Women: Women Artists at The Museum of Modern Art*, ed. Cornelia Butler and Alexandra Schwartz (New York: The Museum of Modern Art, 2010), 303.

<sup>49</sup> The cut defines the difference between action and reaction, between one point of view and another, but as Bergson argues in *Creative Evolution*, we learn nothing about the transition between states beyond a symbolic understanding of cause and effect. Bergson, *Creative Evolution*, 334.

<sup>50</sup> Bergson, *Time and Free Will*, 98. Nor are there quantitative differences between unconscious states.

<sup>51</sup> Bergson, 104.

intensifying the power of Deren's film in affording the viewer a qualitative experience of conscious duration.

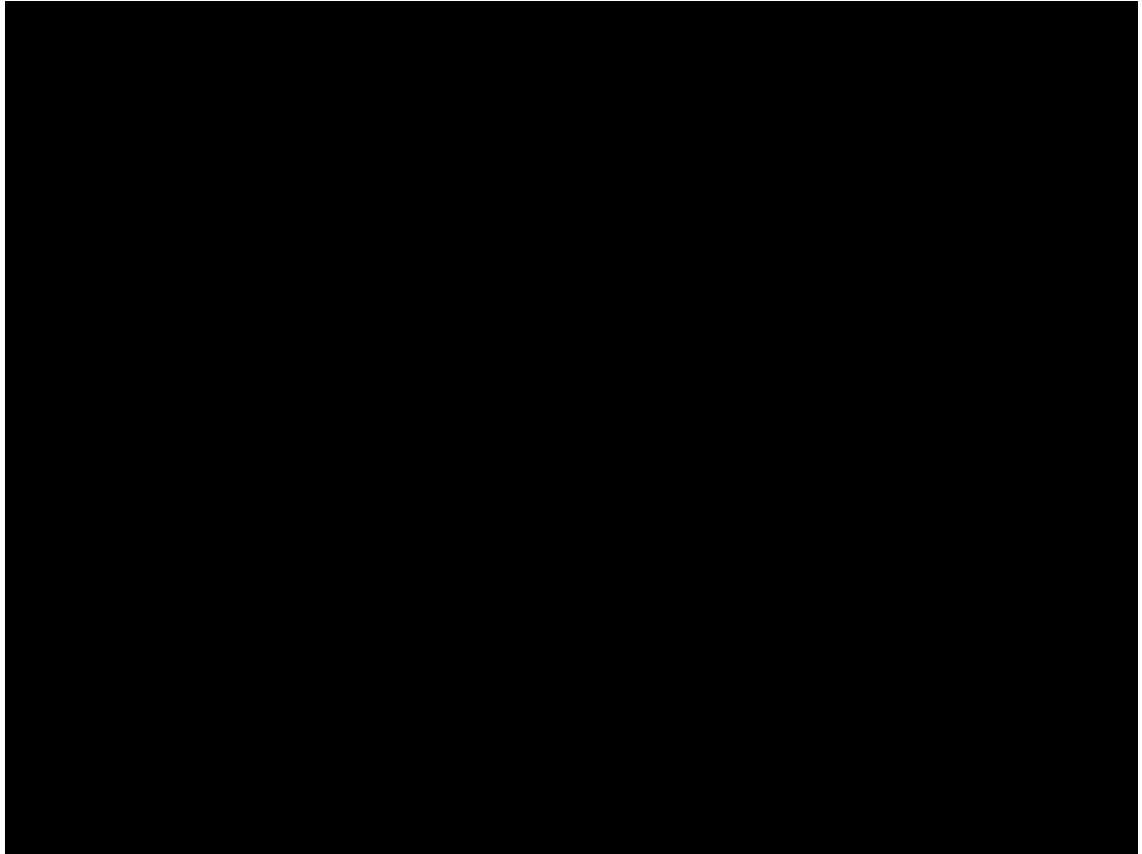


Figure 11: Douglas Goodwin and Rebecca Baron, *Lossless #2* (2008), video still of online documentation, <https://www.vdb.org/titles/lossless-2>.

Connor McGarrigle's *BitTorrent Trilogy* (2011–2013) is comprised of three single channel videos that display datamoshed versions of the popular television shows *Mad Men*, *Game of Thrones* and *Breaking Bad*. In *Mad Men: the BitTorrent Edition* (2011), although hard cuts remain at times, at others, scenes bleed together, and moments are often repeated several times whilst remnants of the same moment remain on screen slightly out of vertical alignment. The episode used for *Mad Men: the BitTorrent Edition* was a departure for the series in the uncharacteristic way it used voice-over to narrate the diary entries of one of the lead characters, Don Draper. At one point a closeup shot of Draper's face jumping into a pool freezes only to be slowly torn away by another shot repeating of two men sitting in a meeting, one putting down a pencil while the other picks up a drink. (fig. 12) The effect of this particular bleed is that the men appear to be digging into Draper's head. During *Breaking Bad: The BitTorrent*

*Edition* (2013), characters originally represented in a succession of multiple shot sizes — long shots, medium shots and close ups — bleed into themselves from different perspectives. Moments are not simply overlaid one upon the other, but echoes of moments just past remain, impinging upon the one still in passing. To create the works, McGarrigle made linear edits of incompletely downloaded digital files of the three shows using the BitTorrent protocol. More than simply studies of digitally deformed colour and movement, these works address the controversial culture of illegal downloading of copyrighted content via peer-to-peer technology, drawing attention to the complex data flows and relations involved in the strong currents of media exchange in a sharing economy that continues to defy copyright laws. They also, as with Baron and Goodwin's *Lossless #2*, defy the usual hard cuts of narrative video and the divisibility of time they signify as one frame bleeds into the next, and characters and events merge with each other in a blended revisioning of the narrative. Their artworks operate to reveal the subperceptual processes that comprise the instantiation of the digital moving image, distorting the original material to provoke a creative enframing by the viewer, who may well discern a strong visual metaphor for the indivisibility of time.

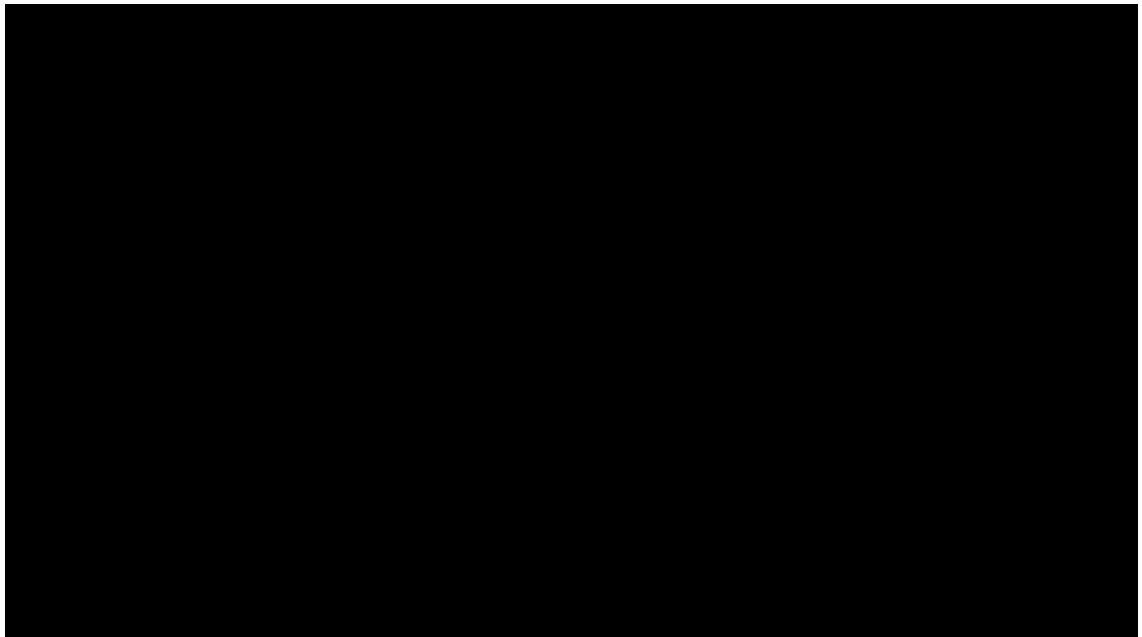


Figure 12: Connor McGarrigle, *Mad Men: the BitTorrent Edition* (2011), video still of online documentation, [https://conormcgarrigle.com/bt\\_trilogy.html](https://conormcgarrigle.com/bt_trilogy.html).

When we watch narrative video containing hard cuts, whether they indicate a change in point of view or time passing, we identify with the idea that lived time and, by extension, conscious states, are segmented in a similar way. Murata, Davis, Goodwin and Baron, and McGarrigle each subvert this idea through their artistic employment of datamoshing techniques to create glitched versions of video reality, muddying the hard cut of video and causing moments to melt into one another as they do in our conscious experience. Whether using trial and error to edit the digital code of video files or making linear cuts in incompletely downloaded video files from file sharing sites premised on complex flows of information between servers across the world, video feedback is central to their practice. For some time now it has also been central to mine, prior to which I had been avidly engaged for several years in provoking all manner of glitches using my smartphone. In the final section of this chapter, I analyze *Curtain* (2016), the second of my artworks comprising *The Feedback Suite*, for which I employed a combination of glitch techniques and post-production processes that, although they differ from those already discussed, result in evoking similar notions of time.

## 2.6 *Curtain* — An Impossible Present

*Curtain* is a seamless video loop comprised of innumerable narrow vertical lines of colour in a constant flux of movement. ([link to video documentation](#)) The lines blend into and out of each other from moment to moment, cycling through different colours and varying widths with an almost hallucinatory effect.<sup>52</sup> Even though the lines are all perfectly vertical they appear to wobble into slight diagonals at times. At certain moments thin lines fade into larger blocks of colour — at one point a large block of red on the left, at another a block of blue toward the right. There is a sense of three-dimensional depth due to the contrasts in colour and hue from one line to the next and every thirty seconds there is a wave of change in colours that is more apparent than the consistent flickering changes. These more significant waves of change provide a macro-

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<sup>52</sup> *Curtain* displays hallmarks of Op Art such as the illusory warping of geometrically straight lines and colour interactions that provoke a sense of depth within the two-dimensional video plane. Unlike traditional Op Art, however, where artists work meticulously to create a discordant figure-ground relationship, the source images comprising *Curtain* were created via an unpredictable process of human-machine interaction.

rhythm beyond the micro-rhythms of the constantly changing coloured lines. After several minutes of watching the viewer may discern that *Curtain* is not an endless continuum of unique colour patterns, but the result of a two-minute video seamlessly looped.

*Curtain* was made by animating still panoramas captured from a direct video feedback loop using the iPhone camera application, WI-FI network and 42-inch LED television screen. The iPhone camera application was used in panorama mode. To make a panorama, the iPhone is moved steadily either left or right, relying on the embedded accelerometer to detect the horizontal movement of the iPhone. The software samples the scene, stitching together each portion of the view to create a consistent whole.<sup>53</sup> The automatic stitching works by matching pixels based on a range of variables, including colour, brightness and contrast. To make the panoramas for *Curtain* the iPhone was held at a slight diagonal angle to the television screen with one long edge touching it. At this proximity, having seeded the loop with some external light, both screens begin to strobe through cycles of colour due to a combination of the proximity of the camera to the screen and the competing refresh rates of the camera and monitor, as well as the autofocus features described in the last chapter. It is impossible for the human optical system to register each colour in this strobing cycle created by the feedback loop between smartphone and television: the speed at which the colours cycle is beyond our ability to consciously comprehend. By dragging the iPhone across the television screen at very close range, panoramas were produced that present a succession of different coloured lines of varying width that bleed into each other as the camera attempted to stitch each colour in the strobing cycle into one continuous image. Some of these sections of colour are straight edged while others are jagged. (fig. 13) *Curtain* is the result of layering a selection of the stills over one another and applying transition effects to each successive overlap in After Effects. This created movement as each still image slowly transitions into the next, to which I applied colour enhancement, gaussian blur and refraction effects. The combination and layering of these effects resulted in the highly ordered arrangement of lines in the final work.

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<sup>53</sup> The process is a form of slit-scan processing where narrow image slices are stitched together to create images of stretched out time or compressed space.

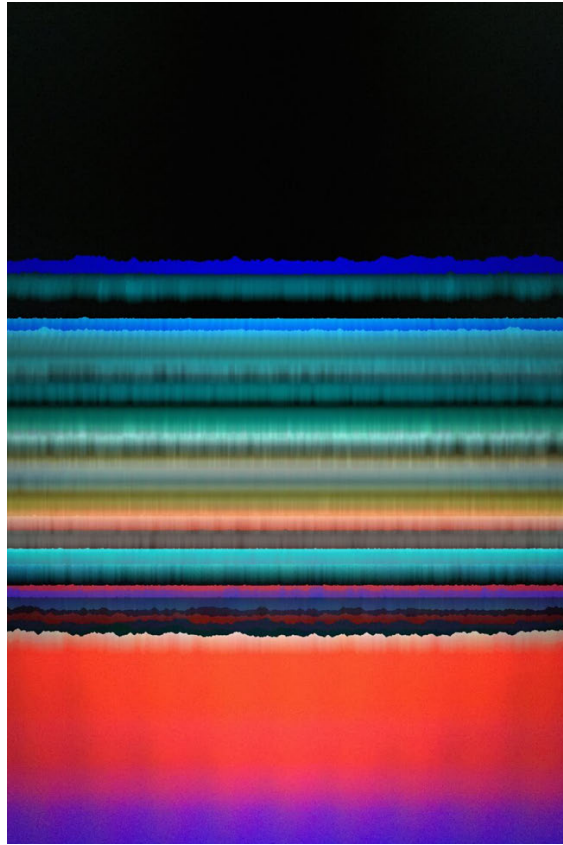


Figure 13: Justin Harvey, *Curtain source image* (2016).

Like all of the works in *The Feedback Suite*, *Curtain* was created through the shaping of video feedback into an almost psychedelic experience similar to those evoked by certain feedback works from the 1960s such as Eric Siegel's *Psychedelivision*, discussed in the previous chapter. The title of the work is both descriptive of the work's appearance, that of a shimmering curtain of light, and a reference to the digital video screen as façade, masking the invisible flows of binary code that may be instantiated to deliver experiences in any chosen moment of our technologically mediated lives. *Curtain* represents an excess of human control over the digital video image through several stages of capture and manipulation of the chaotic video feedback that provided the source material, whilst also affording an appreciation of the ongoing struggle for control between man and machine. The process of capturing panoramic still images of the feedback loop from which *Curtain* is derived amounts to a process of glitching. In contrast, however, to the compression artefacts present in the datamoshed artworks discussed earlier, where the pixels from one frame bleed into the image of the next, *Curtain* retains the echoes of the glitched panoramas as thin lines of colour that bleed

into each other during certain intervals of its potentially infinite duration. These subtle compression artefacts are liable to provoke the kind of creative enframing Hansen proposes, where the viewer becomes actively engaged in deciphering meaning.

Apple introduced the panorama feature with the release of iPhone 5 in September 2012.<sup>54</sup> The software automates the stitching of several vertical frames into one image so that if you have a steady hand and there is not much movement within the frame, you can capture a seamless panoramic image. In the production of *Curtain*, rather than stitching together segments of a static scene, the software was forced to stitch rapidly strobing, highly contrasting fields of colour together to create images delineated by alternating sharp lines and jagged edges resembling tears. As such, these images display an obvious glitch aesthetic, resulting from the intentional misuse of digital imaging technology as a knowing intervention into the way it functions. By disrupting the logic of the image making system, the tension inherent in collaboration between human and machine is revealed in these images. They represent glitched snapshots of the video feedback loop that can be equated with the way we construct our knowledge of the world.

Bergson equates the mechanism of our ordinary knowledge of the world, consisting of images, where we recompose a series of snapshots of our passing reality into an artificial representation of becoming, with that of cinema. In his words, rather than “attaching ourselves to the inner becoming of things, we place ourselves outside them in order to recompose their becoming artificially.”<sup>55</sup> It is through this mechanism that we are able to act practically in response to events in the world, and just as actions are discontinuous, so too our ordinary knowledge is discontinuous. But Bergson advocates for a second type of knowledge, in contrast to this cinematographical method, where “moments of time, which are only arrests of our attention, would no longer exist; it is the flow of time, it is the very flux of the real that we should be trying to follow.”<sup>56</sup> This second type of knowledge opens us up to the reality of life as not already made but

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<sup>54</sup> For an in-depth history of the panorama see Stephan Oettermann, *The Panorama: History of a Mass Medium* (New York: Zone Books, 1997).

<sup>55</sup> Henri Bergson, *Creative Evolution*, 332.

<sup>56</sup> Bergson, 372.



constantly in the making. The process of returning the panoramic stills to the flux of duration in *Curtain* is an attempt to provoke this second type of knowledge.

More than a simple recomposition of still images, *Curtain* reclaims the succession of strobing colour fields of the original feedback loop that were beyond human perception and places them into a continual flux of movement. The snapshot, the cut, the jagged, glitched stitch becomes motion: blurred, stretched and divided into hundreds of segments in constant flux. This reconstitution is not completely faithful to the original loop; nothing can be perfectly repeated in time. Even the flawlessly replicated playback of digital video becomes differentiated from previous loops each time it is viewed as human perception is indubitably influenced by the memory of past experiences. *Curtain* intends to encourage the viewer to appreciate life, to whatever extent it might be experienced through digital media, as in the making, rather than having already been made. As Bergson states:

In order to advance with the moving reality, you must replace yourself within it. Install yourself within change, and you will grasp at once both change itself and the successive states in which *it might* at any instant be immobilized.<sup>57</sup>

*Curtain* invites the viewer into a flux of change to provoke a return to the flow of duration and a recollection of their creative capacity.

If we can accept Bergson's position that time as consciously experienced is characterised by continual change as one moment blends into the next, it follows logically that it is impossible to locate a pure present moment as distinct from all others. The present that we experience is dependent upon the interval of duration that we pay attention to at any given moment. As Bergson puts it, "when we speak of our present we are thinking of a certain interval of duration... It is impossible to fix it exactly, as it is something rather elusive."<sup>58</sup> This is because each interval, though it may seem bound by certain dates and times or actions and events, contains the memories of our past and

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<sup>57</sup> Bergson, 334 (emphasis in original).

<sup>58</sup> Bergson, *The Creative Mind*, 178.

our conscious projections into an unknown future. Dan Graham demonstrated the impossibility of divorcing the present moment from the future and the past with his artwork *Present Continuous Past(s)*, discussed in the previous chapter, and this aspect of Bergson's philosophy is also strongly alluded to in *Curtain*, albeit in a far more abstract way to that of Graham. Rather than placing viewers within a delayed feedback loop wherein they are faced with recent versions of themselves, with *Curtain*, I confront viewers with a video frame separated into countless shimmering divisions. In this way *Curtain* presents a paradox of sorts, as even though there are multiple divisions within the frame, the constant change between and among them renders the viewer unable to identify with any distinct present moment within the work. As such, *Curtain* works to question the possible existence of discrete present moments within our conscious experience in a similar way to Galanter's *Untitled (Cables) V072739A*, discussed in the introduction, and thereby arguing for the indivisibility of time.

In this chapter I described how during the 1990s, the increasing prevalence of digital media and its distribution via the internet created a global network society in which cultural experience had begun to be externalised in multimedia. I analysed how Mark Hansen reconceptualised Bergson's idea of the body as a centre of indetermination for the digital age and took up his view with the reservation that only when destabilised could digital video provoke a creative enframing by the viewer. I explained how artists enjoyed an excess of control over the digital video image and described how they engaged with various processes involving feedback within the diverse field of glitch practices to shape digital video in order to critique the apparent digitisation of culture. I outlined the widely accepted readings of glitch practices such as datamoshing and the artworks that result, arguing for new readings of specific artworks including the tendency of such artworks to provoke an understanding of time as indivisible in accordance with Bergson's philosophy. Finally, I analysed my artwork *Curtain*, describing how the combination of glitch practices and post-production techniques were used to shape video feedback into an experience that defies the division of time by refusing to acknowledge a distinct present moment. The multitude of movement within the frame, divided yet incapable of division, can also be read to signify the subperceptual processes that comprise both the instantiation of digital video and the

neurological components involved in human perception. The cumulative experience of viewing *Curtain* ultimately evokes the consistency of change that belongs to our conscious experience of time. In the next chapter, I consider video feedback loops as metaphors for human consciousness in considerably more depth when I discuss the third artwork from *The Feedback Suite*.

## CHAPTER 3

### Strange Loops of Video Consciousness

The aim of this chapter is to advance an understanding of the artistic use of video feedback as a metaphor for human consciousness. I argue that my own *Emergent* (2019–2020) and Marc Fichou’s *The Artist* (2014), which both contain live video feedback, provoke notions of human consciousness as an emergent phenomenon of nature and of time as indivisible. I begin by describing my artwork *Emergent*, to which I refer throughout the remainder of the chapter, and demonstrate how the experience of time when viewing *Emergent* can be aligned with Bergson’s concept of duration. Critical philosopher David Kreps construes Bergson’s theory of evolution, which relies on duration, to mirror current understandings of emergence theory. Artists including Peter Donebauer and myself have come to understand video feedback as a metaphor for human consciousness in accordance with such theories. I analyse multidisciplinary artist Marc Fichou’s *The Artist* (2014), comprised of live video feedback exhibiting complex geometrical shapes alongside a large collection of artefacts, the juxtaposition of which points to an equivalence between video feedback and concepts of self-organisation and emergence in nature. I argue that Fichou’s use of video feedback in *The Artist* can be aligned with the way cognitive scientist Douglas Hofstadter uses video feedback as a metaphor for his notion of consciousness as a “strange loop.” I claim that installations of *The Artist* reflect tensions in philosophical arguments around definitions of consciousness and the ways it is thought to emerge as exemplified by the contrasting theories of Hofstadter and philosopher Evan Thompson. Finally, I explicate how both *Emergent* and *The Artist* encourage viewers toward an intuitive experience of video feedback in accordance with Bergson’s philosophy, where the video feedback loop becomes a metaphor for human consciousness, in which the experience of time is indivisible.

### 3.1 Emergent: Live Video Feedback

*Emergent* is comprised of a live, direct video feedback loop accompanied by two single channel videos of previously captured feedback sessions — *Emergent 6* and *Emergent 9* — installed either side of the live loop on matching screens. ([link to video documentation](#)) The live loop consists of an iPhone mounted flush against a 65-inch LCD television screen on which its output is mirrored via WI-FI using an Apple TV, and the pre-recorded loops are the result of almost identical technical setups. The iPhone camera is completely zoomed in so that the feedback loops involve the smallest component of the television screen as possible given the restraints of the smartphone camera technology, limited to a few pixels.<sup>1</sup> The high definition screen contains over two million pixels that together make up the image on the screen, therefore the video image in each channel of *Emergent* is made up of a few pixels expanded to cover these two million. Accordingly, the resultant video images represent the extent of the camera's capacity to express the forces at work within the technology that comprises the video feedback loops, the significance of which will be dealt with later in this chapter.

The live loop is impossible to describe prior to its installation as each iteration results in a unique aesthetic outcome. In the documentation of the specific installation accompanying this thesis it presents as a pulsing blue frame intermittently interrupted with the square yellow autofocus and exposure icon (which also appears in *Eye of the Beholder*). The icon represents the camera's ongoing attempts to stabilise the image, evidencing a self-sustaining system of video feedback on the edge of equilibrium. Like the live loop, the pre-recorded loops display the outcomes of self-organised systems of video feedback, although each loop presents considerably different aesthetic qualities. *Emergent 6* displays what looks like a shuddering red cloud slowly edging its way from the top of the screen to eventually fill the screen for a time before slowly abating toward the bottom right of the screen, leaving it blank. The cycle repeats several times in a similar manner but never in exactly the same way. In contrast to this gently recurring

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<sup>1</sup> The screen is comprised of light emitting diodes (LEDs) that act as the light source for a liquid crystal display (LCD) that controls the amount of light that reaches the red, green and blue filters that make up each pixel of the screen. The colour of each pixel depends on the amount of light filtered through each of the red, green and blue filters.

cycle of feedback, *Emergent 9* presents as what can be described as red noise, the digital equivalent of the white noise of an analogue television when it is not receiving any signal. With sustained attention, a viewer may discern a variety of phenomena within the swirling, seemingly chaotic feedback. Depending on the viewer's distance from the screen and where they focus their attention, these phenomena include countless flickering small black dots reminiscent of insects swarming rapidly in fluctuating patterns on the screen and energetic whirlpools of various sizes blending into and out of one another. At just the right distance and with a certain focus of attention there may be a feeling of being drawn into a vortex.

The use of the smartphone camera and Apple TV as apparent elements of the live feedback loop of *Emergent* presents a subversion of the normal use of these technologies.<sup>2</sup> An Apple TV is designed to be used to access streaming video content or to mirror the screen of another Apple device such as an iPhone to view pre-existing content stored therein. *Emergent* offers an alternative to the usual mode of consumption of video using these technologies. Rather than providing access to video content as reassembled segments of recorded time, able to be accessed at any point, reversed or paused indefinitely, the live loop of *Emergent* brings the viewer into contact with time looped back on itself, with no ability to reverse the process or experience the same moment twice. Each successive state of the feedback loop witnessed on the screen is inseparable from its former states as it is constantly in motion. This experience of time aligns with Henri Bergson's concept of pure duration: "the form which the succession of our conscious states assumes when our ego lets itself *live*, when it refrains from separating its present state from its former states."<sup>3</sup> Bergson's concept of duration, indivisible and irreversible, is at the core of his philosophy, not just in terms of human consciousness, but also with respect to his theory of evolution. In the following section I explain how Bergson's theory of evolution has been shown to accord with contemporary complexity theory, specifically the concept of emergence. In the process I outline how artists, including myself, have come to understand video feedback as a metaphor not only for evolution in nature but for consciousness itself.

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<sup>2</sup> While this subversion is implied in *Emergent 6* and *Emergent 9*, it is made explicit in the live loop of *Emergent*.

<sup>3</sup> Bergson, *Time and Free Will*, 100 (emphasis in original).

### 3.2 Bergson's Original Impetus — Time

In *Creative Evolution*, Bergson explains his theory of evolution on our planet. His intention is to provide an alternative to both mechanistic conceptions of evolution, where life is seen to evolve through a series of adaptations to environmental factors, and finalistic views, where evolution progresses in accordance with some grand predetermined design. His alternative is to posit an *élan vital*: an “original impetus... an internal push that has carried life, by more and more complex forms, to higher and higher destinies.”<sup>4</sup> Essential to a clear understanding of his image of an original impetus is an acknowledgment that it requires time — irreversible and chronological — in order to progress. As Bergson puts it: “*Wherever anything lives, there is, open somewhere, a register in which time is being inscribed.*”<sup>5</sup> The core of the mechanistic conception of evolution, according to Bergson, is that the past and the future are “calculable functions of the present,”<sup>6</sup> and so like finalism, where “things and beings merely realize a programme previously arranged... time is useless.”<sup>7</sup> In opposition to these theories of determination, which entail a view that stands outside of time, where “all is given,”<sup>8</sup> Bergson maintains that “at the root of life there is an effort to engraft on to the necessity of physical forces the largest possible amount of *indetermination*.”<sup>9</sup> This effort proceeds in time, unpredictable in its outcomes and impeded by matter in every moment of its duration, an effort that is inextricably linked, for Bergson, with consciousness itself:

It is as if a broad current of consciousness had penetrated matter, loaded, as all consciousness is, with an enormous multiplicity of interwoven potentialities. It has carried matter along to organization.<sup>10</sup>

Had Bergson not qualified this statement with “it is as if,” it might seem that his view of consciousness admits to a belief in panpsychism, “the view that all things have mind or

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<sup>4</sup> Henri Bergson, *Creative Evolution*, 113.

<sup>5</sup> Bergson, 20 (emphasis in original).

<sup>6</sup> Bergson, 43.

<sup>7</sup> Bergson, 45.

<sup>8</sup> Bergson, 45.

<sup>9</sup> Bergson, 127 (emphasis in original).

<sup>10</sup> Bergson, 199.

mind-like quality.”<sup>11</sup> Indeed, in a lecture published in *Mind-Energy: Lectures and Essays*, Bergson eludes more strongly to this belief, saying “life must have installed itself in a matter which had already acquired some of the characters of life without the work of life.”<sup>12</sup> Here again he seems to suggest a bent toward the view that all matter possesses some aspect of mind. Elsewhere in *Creative Evolution* he seems to approach a panpsychist view when he says

Consciousness, or supraconsciousness... which is a *need of creation*, is made manifest to itself only where creation is possible. It lies dormant when life is condemned to automatism; it awakens as soon as the possibility of a choice is restored.<sup>13</sup>

As a need of creation, here consciousness for Bergson appears to revert back to something of an impetus. Thus, even though he uses the term *supraconsciousness*, which without further explanation must be taken to mean something above consciousness, he doesn’t assert that it exists in inert matter. Ultimately, I agree with philosopher David Skrbina when he argues in relation to Bergson, that “he always stopped short of clearly articulating a full panpsychist or hylozoist position,” even though at times he seems to support it.<sup>14</sup>

Artists interested in expanding consciousness and experimenting with video feedback have certainly pondered the panpsychist position. Artist Mick Glasheen felt he was witness to “a new life form” on seeing video feedback for the first time, and Peter Donebauer was drawn to the way video feedback seemed to mimic natural processes of creation.<sup>15</sup> As I experimented with video feedback during the feedback session that was to become *Eye of The Beholder*, I could not help thinking that there was something beyond the purely physical process that was occurring that caused the image of the blinking eye to appear. As my research progressed, I came to understand that the

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<sup>11</sup> David Skrbina, *Panpsychism in the West* (Cambridge, MA: MIT Press, 2005), 2.

<sup>12</sup> Henri Bergson, *Mind-Energy: Lectures and Essays*, trans. H. Wildon Carr (New York: Henry Holt and Co., 1920; Westport, CT: Greenwood Press, 1975), 26–27. Citations from Greenwood Press edition.

<sup>13</sup> Bergson, *Creative Evolution*, 284–285 (emphasis in original).

<sup>14</sup> Skrbina, *Panpsychism in the West*, 159.

<sup>15</sup> Jones, *Synthetics*, 256.



complex patterns that can be produced using video feedback are in fact instances of emergence; a concept that relates closely to Bergson's notion of original impetus.

Bergson positions the impetus that he claims is at the root of life, or consciousness infused into matter, in opposition to the second law of thermodynamics. This law is mathematically calculable as entropy, or, as he explains it, "the fact that all physical changes have a tendency to be degraded into heat, and that heat tends to be distributed among bodies in a uniform manner."<sup>16</sup> Opposed to this tendency, which he characterises as the descent of matter, is the ascent of life and consciousness, arising out of an original impetus that diverges over time. Bergson describes each unique evolutionary divergence in nature as dependent on a combination of "the resistance life meets from inert matter, and the explosive force — due to an unstable balance of tendencies — which life bears within itself."<sup>17</sup> This unstable balance of tendencies that Bergson posited in 1907 can be equated with what is now known as a dissipative structure, where spontaneous order tends to arise through the exchange of energy between a living open system and its external environment.

Trans-disciplinary critical philosopher David Kreps painstakingly aligns elements of Bergson's philosophy of evolution, as outlined in *Creative Evolution*, with a number of tenets of contemporary complexity theory, specifically those held within the field of environmental biology. He argues that Bergson's reasoning is mirrored significantly in developments in contemporary theories on the evolution of life on the planet.<sup>18</sup> He traces how complexity theory advanced out of second-wave cybernetics, where the stability, or equilibrium, of autonomous systems was understood as "a quality that comes from within the system and its ability to maintain itself, not from comparison to an external reference."<sup>19</sup> Relying primarily on the work of theoretical biologist Stuart Kauffman and mathematician and biologist Brian Goodwin, Kreps explains how complexity theory developed to explain the evolution of life in opposition to entropy through the process of emergence. Living beings are not strictly autonomous

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<sup>16</sup> Bergson, *Creative Evolution*, 265.

<sup>17</sup> Bergson, 109.

<sup>18</sup> David Kreps, *Bergson, Complexity and Creative Emergence* (London: Palgrave Macmillan, 2015), 155.

<sup>19</sup> Kreps, 181.

systems; they interact with the wider environment and as such exist in nonequilibrium states, with the potential to become dissipative structures, “through which matter and energy pass, linking not just their substance but their function and their structure to the environment in which they are situated.”<sup>20</sup> Furthermore, nature, it seems, tends to favour particular states, known as attractor states, which differ in both equilibrium and nonequilibrium systems. Kreps sums up as follows:

On the universal scale, entropy is drawing all things in the universe towards an ultimate state of rest — the ‘death’ of the universe. But in nonequilibrium *open* systems, by contrast, the ‘attractor’ state appears to be the spontaneous order of these dissipative structures. The order of the equilibrium closed system is rest, completed entropy, death. The spontaneous order of the open system is the dissipative structure: order, apparently... from chaos, and not the other way around. *Emergence*, then, is the term used to describe how the ordered structures which, beyond the possibility of predicting them from their constituent parts, tend (by attraction) to *emerge* spontaneously in open systems — in the opposite direction from the general tendency of entropy.<sup>21</sup>

This summation from Kreps accords with Bergson’s conception of evolution as the ascent of life in opposition to the descent of matter. Bergson’s view of evolution as a bifurcating tendency driven by an original impetus closely resembles Kreps’ description of the attractor state in nonequilibrium systems. Kreps, indeed, manages to discern a correlation between Bergson’s original impetus and the concept of emergence as he defines it, particularly considering that emergence, according to Kreps, “presupposes a durational succession.”<sup>22</sup> It appears Bergson was on the right track with his formulation of an evolutionary impetus to self-organisation that progressed, due to the irreversibly of time, according to a natural ascendant tendency in opposition to the descendent tendency of matter as entropy increases.

It is an ascendant or emergent tendency that artist Peter Donebauer, whose work I discussed in chapter one, now recognises as being generated through video feedback.

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<sup>20</sup> Kreps, 181.

<sup>21</sup> Kreps, 183–184 (emphasis in original).

<sup>22</sup> Kreps, *Bergson*, 184.

In an interview with Chris Meigh-Andrews in 2000, some thirty years after he first began working with video feedback, Donebauer describes how science has explained why video feedback can create patterns found in nature: “video feedback is a complex process exactly like all those others [chaos and complexity theorists] write about now... it is the same force emerging.”<sup>23</sup> When asked about whether there might be some kind of fundamental relationship between video and consciousness, Donebauer shies away from the question of consciousness itself, preferring to speak in terms of “the way the brain functions — the speed of the nervous system... those electronic and magnetic signals seem to have similar properties to some fundamental processes that are similar to how we operate.”<sup>24</sup> Despite Donebauer’s reservations here in aligning video with consciousness, he states elsewhere in the same interview, that with his art he is “trying to represent consciousness.”<sup>25</sup> It seems safe to conclude then that not only does Donebauer consider video feedback a process analogous to the forces of nature responsible for emergence, but also as a metaphor for human consciousness itself.

This metaphor was front of mind as I developed *Emergent*, and it resonated with concurrent research into Bergson’s philosophy of evolution, consciousness and time. Bergson’s notion of an irreversible continuity of time that enables the evolutionary impetus to self-organisation is reflected in the way the simple recursive video feedback loops of *Emergent* can result in complex patterns, at times seemingly chaotic — as in the red whirlpools of *Emergent 9* — yet at others apparently self-organised as evidenced in the more stable cycles of the red clouds of *Emergent 6*. As noted earlier, Bergson’s concept of conscious duration, where our present is inseparable from our past, is also mirrored in the live feedback element of *Emergent*. With each successive loop, the video feedback changes whilst retaining part of its form from the previous iteration, much like the way we absorb the fleeting moments we experience and they continue to exist, to greater or lesser extent, alongside each passing perception: the passing present and the past tangled up in forward motion.

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<sup>23</sup> Meigh-Andrews, “Interview with Peter Donebauer.”

<sup>24</sup> Meigh-Andrews, “Interview with Peter Donebauer.”

<sup>25</sup> Meigh-Andrews, “Interview with Peter Donebauer.”

However, human memory is unreliable, rarely picture perfect in its detail, nor as accurate as we might prefer. Sometimes that works to comfort us: we can remake the past when it suits us; at other times we feel the loss of moments we rather would have liked to draw out for much longer than the laws of physics could ever allow. And yet without the inevitability of change in time we could not progress. The video technology available in devices at our fingertips, like smartphones, might lead us to believe that we can capture time, demarcate it from the relentless flow of change that we endure uninterrupted. In *Emergent* the same device that seemingly enables us to capture moments, segments of time, and replay them at our leisure, is set before the viewer in a system where time loops back on itself, much like the one in which we exist — the constant feedback loop of consciousness. In this way, the video feedback loop becomes a compelling metaphor for human consciousness. In the next section I describe how Marc Fichou also turns the camera on its own output, presenting video feedback as a metaphor for evolution and human consciousness.

### 3.3 Emergence vs Creation

Marc Fichou works with video feedback as part of a diverse practice, performing artistic investigations that deal with the nature of creativity, consciousness and time. *Plastron* (2010) presents a video of Fichou applying a mix of black paint and plaster of Paris to his face in close-up to form a cast. The mask that becomes of this process is positioned facing the video that is playing back through a two-way mirror so that both the process and the result are overlaid. By erasing his own image in order to create an analogue of it, Fichou presents a tension between himself as subject and self-made object. His *Paper on Paper* series (2012) comprises prints of origami animals and objects photographed and printed onto paper that is then folded into the same object, then unfolded. The resulting images show both the completed objects and traces of the process of folding used to create them, Fichou's intention being "to move the viewer between the past, present, material and the image."<sup>26</sup> Both of these works juxtapose the process of creation with the physical object that results. The process of creation in *Plastron* is displayed in

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<sup>26</sup> Marc Fichou, *Ceci N'est Pas: Art Between France and Los Angeles*, accessed 12 June, 2019, [https://www.youtube.com/watch?v=\\_mL8liu8D1o](https://www.youtube.com/watch?v=_mL8liu8D1o).

real time, whereas in the *Paper on Paper* series, traces of the process remain in the folds of the paper on which photographs of the origami figures have been printed. Fichou constructs more complex associations between process and outcome in various installations of his work *The Artist* (2014), where he juxtaposes the process of live video feedback with the resulting images, along with a variety of artefacts in a multifaceted exploration of consciousness, creativity and time.

*The Artist* comprises of a video camera mounted at a 45-degree angle and pointed at a small LCD screen to which it is connected via a cable, all encased in an aluminium and plexiglass structure resembling a coffin. (fig. 14) When installed, the feedback machine, as Fichou refers to it, is seeded daily using an LED light, causing ever-changing intricate geometrical structures to emerge. *The Artist* has been installed in various exhibitions alongside a wall-sized projection mirroring the continually changing image on the LCD screen that forms part of the feedback loop and a collection of artefacts presented on tables and large wood panels. The artefacts include still images captured from past streams of video produced by *The Artist* and other feedback systems previously set up by Fichou, interspersed amongst numerous other found images and objects, including several made by Fichou himself.<sup>27</sup> The exact configuration of the artefacts varies slightly each time the work is installed: in the following discussion I refer to the installation of *The Artist* in the 2016 exhibition *Uncertainty* at ArtCenter's Williamson Gallery in Pasadena, California. The artefacts can be grouped thematically as follows: images of existing artworks, mathematical patterns, religious iconography, images from nature (from the microscopic to the astronomic) and technological components (including images of circuit boards and a driver from a loudspeaker). The seemingly random assortment of artefacts draws the viewer into a process of sense-making as they attempt to understand how the images correspond to one another and to the ongoing imagery created by *The Artist*. I will briefly analyse these artefacts based on the groupings I have just identified before going on to point out their various correspondences.

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<sup>27</sup> These feedback systems vary in scale, and Fichou draws on a range of methods for seeding his feedback loops, including drips of paint, the frame of the screen itself and points of light.

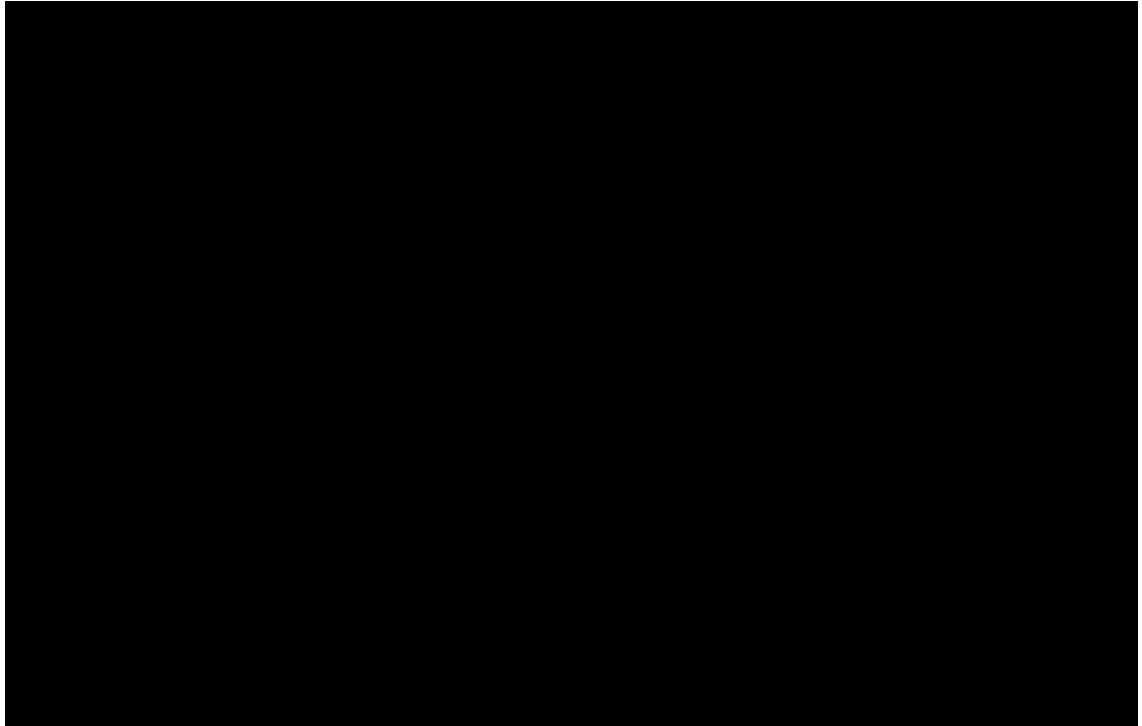


Figure 14: Marc Fichou, *The Artist* (2014), installation view at *Ouroboros*, 31/1/2014 – 8/3/2014, Young Projects, Los Angeles, California, <https://www.marcfichou.com>.

The images of existing artworks among the artefacts reference various methods used throughout history to make sense of the world. An illustration by artist Peter Paul Rubens from physicist and architect François d'Aguilon's *Six Books of Optics* (1613) shows the points on a sphere being mapped onto a plane, referencing the history of stereography, the projection of three-dimensional things onto a two-dimensional surface. The cover image from polymath Athanasius Kircher's *Iter Exstaticum* (1660) by printmaker Johann Friedrich Fleischberger shows the author being led by an angel on a journey through the cosmos, denoting a spiritual journey toward understanding. An image from poet Ludwig Tieck's *Minnelieder aus dem Schwäbischen Zeitalter* (1803), shows two cherubs sitting on flowers, seemingly mirror images of one another, touching one another's fingers to create light at the centre of an ouroboros. This image, in particular, appears to suggest that we are our very own creations, in contrast to Michelangelo's *The Creation of Adam* (1508), displayed on a different panel depicting the creation of man by God. Taken together, along with interspersed religious iconography that attests to widespread belief in deities that are the source of material creation, these artefacts reference humankind's broader struggle to understand the

nature of our existence and to control our environment through disparate strategies, including mapping, mathematics, reflection, recursion and magic.

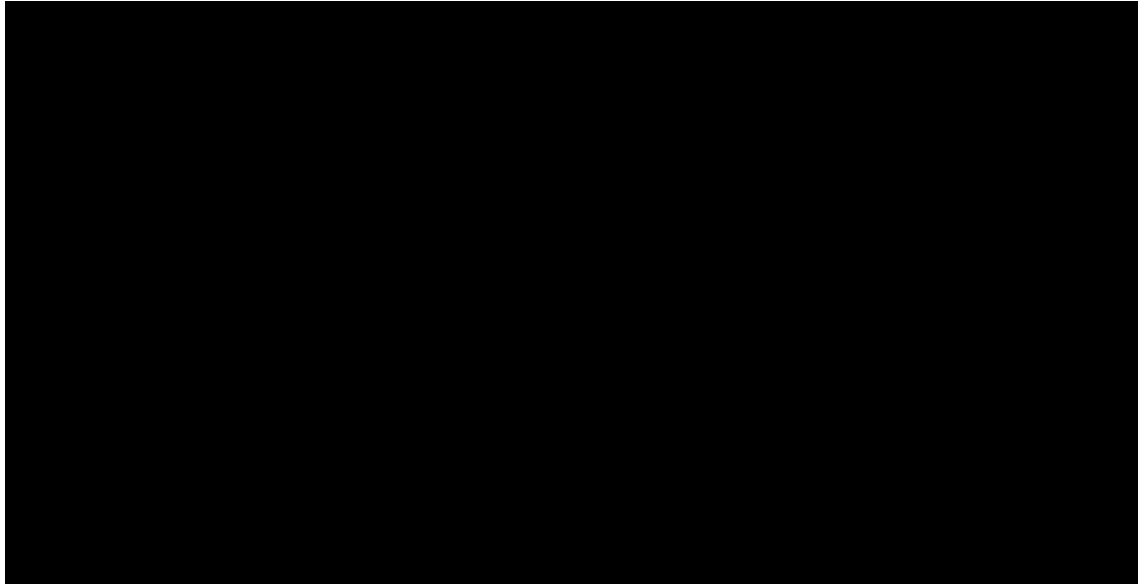


Figure 15: Marc Fichou, *Panel close up: Time Field* (2014), online documentation, <https://www.marcfichou.com>.

The artefacts that depict mathematic concepts broadly signify the human desire to create patterns that represent the world, although specific placements of these images encourage more pointed connections. (fig. 15) In one panel a detail image of a statue at Wat Rong Khun in Thailand displaying a buddha surrounded by ornate gold carvings mirrors the patterns in images of Mandelbrot sets on the opposite side of the panel.<sup>28</sup> Between these two artefacts is an image of a field of sunflowers, the seeds of which grow in fractal curves much like Mandelbrot sets. By creating such juxtapositions, Fichou leads the viewer to consider the close similarities between patterns seen in nature, mathematical reasoning and artistic creation inspired by spiritual practice and belief. In another example a satellite image of a swirling storm cell is placed between a similar pattern produced from feedback and an image of whirling dervishes meditating in a dance, the point of which is to circumvent their egos. This particular combination of images not only points to the way that images from feedback mirror patterns in nature, but also how humans have developed rituals through which they seek to move beyond

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<sup>28</sup> Mandelbrot sets are fractal equations originating in complexity theory that display as infinitely complex patterns self-similar across different scales.

their self-identifying consciousness and connect with the larger mysteries of creation. Through the arrangement of these and many other artefacts alongside *The Artist* and its real-time output, Fichou encourages the viewer to undertake a conscious process of discerning order from his carefully curated chaos. *The Artist*, as self-organising system, reflects self-organising systems in nature, as well as the variety of ways humanity has attempted to organise our consciousness to understand the world within which we find ourselves.

Fichou's interest in self-organising systems is evident on his website, where he presents the outcomes of video feedback experiments, including video documentation and still images he labels "self-generated."<sup>29</sup> Alongside them are appropriated, annotated definitions from the field of complexity theory, one of which concerns the concept of the edge of chaos, further evidence of his interest in exploring feedback systems and the emergent phenomena that tend to arise from them.<sup>30</sup> Fichou maintains that *The Artist* does not create anything, rather it provokes emergence, generating images completely unconnected to anything outside of itself, and any perceived equivalence made between the resultant images and things already known to us are constructed by the viewer themselves.<sup>31</sup> Yet Fichou has positioned the artefacts in specific combinations to evoke correspondences between them. Accordingly, I suggest that part of the tension within Fichou's installations of *The Artist* arises from the viewer's realisation that *The Artist* and Fichou's other video feedback machines have produced images that so closely resemble patterns found in nature. As discussed previously, artists who work with video feedback have long been preoccupied with theses uncanny resemblances.

Writer and curator Paul Young claims that Fichou's video feedback artwork reverses a perceived division between technology and nature. He argues that Fichou advocates for the opposite view: that technology and nature operate in similar ways.

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<sup>29</sup> Marc Fichou, "Ongoing Project," accessed July 12, 2019, <https://www.marcfichou.com/ongoing-project>.

<sup>30</sup> "A region of bounded instability that engenders a constant dynamic interplay between order and disorder... adaptation to the edge of chaos occurs in almost all systems with feedback," from "Untitled Image," Marc Fichou, accessed July 12, 2019, <https://www.marcfichou.com/ongoing-project>.

<sup>31</sup> Carl Lindstrom, *Ouroboros: Interview with Marc Fichou*, YouTube, June 2014, accessed 13 July, 2019, <https://www.youtube.com/watch?v=GrMGsJy5EgA>.



According to Young, Fichou's installation of *The Artist* alongside the artefacts may lead viewers to consider whether a similar kind of feedback "might have influenced the very shapes and forms of the physical world that we all know. And if you take that a step further, you might apply that to ideas, thoughts and perception too."<sup>32</sup>

I agree with Young's suggestion here that Fichou's work uses the process of video feedback not only as a metaphor for the way that forms evolve in nature, but also for the way that consciousness arises. Young relies in his argument on cognitive scientist Douglas Hofstadter's use of video feedback as a metaphor for human consciousness in his book, *I Am A Strange Loop* (2007). Although this is an insightful connection by Young, he refers to Hofstadter only glancingly, avoiding a detailed explanation of Hofstadter's thinking and the way it relates to Fichou's work. It is to Hofstadter, then, that I will now turn and compare his thinking with that of philosopher Evan Thompson in order to draw out this metaphor in more detail and elucidate the central tension of the work.

### 3.4 The Strange Loop of Consciousness

Hofstadter argues that human consciousness — or more specifically, the conscious sense of selfhood — is an illusion that emerges from the complex layers of feedback that occur within the human brain. For Hofstadter, consciousness is a "strange loop," out of which the illusion of the subjective self arises due to the complex interactions of symbols that he refers to as "the dance of symbols inside the cranium."<sup>33</sup> At the level of this dance, which includes symbols for both external and internally perceived phenomenon, the self is ultimately understood to exist over and above the physical microprocesses from which it emerges. It is this dance — our ability to think — coupled with our inability to perceive the microprocesses that underlie this strange loop of consciousness. We do not, in our everyday experience, have any cognisance of the countless complex processes of feedback occurring within our nervous system that contribute to our conscious experience of the world. Rather, our everyday attention is focussed on the

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<sup>32</sup> Paul Young, *Ouroboros*, Young Projects Gallery website, 2014, accessed 9 May, 2019, <https://www.youngprojectsgallery.com/marc-fichou>.

<sup>33</sup> Douglas Hofstadter, *I Am A Strange Loop* (New York: Basic Books, 2007), 276.

high-level understandings of the world we experience as a combination of direct experience and memory. Hofstadter argues that it is because of this that we become locked into the illusion of a conscious self that is separate to the physical processes that constitute our continued existence.

Philosopher Evan Thompson characterises views akin to those held by Hofstadter as neuro-nihilistic and is fundamentally opposed to them.<sup>34</sup> According to Thompson, the mistake of the neuro-nihilist argument is that it assumes that to understand the conscious self as something beyond an illusion, the conscious self must be thought of as self-subsisting or independently existent. Thompson does not accept this assumption for two reasons. First, the feeling of being “a subject of experience and an agent of action” does not equate to the existence of a fully substantive ego, especially as it can be shut down, during sleep for example.<sup>35</sup> This awareness of both the external environment and the ability to perform actions within it do not in and of themselves give rise to a conscious sense of self. Second, Thompson considers the word ‘I’ as a verb rather than a pronoun. In his own words:

One individuates oneself as a subject of experience and agent of action by laying claim to thoughts, emotions, and feelings — as well as commitments and social practices — and thereby enacts a self that is no different from the self-appropriating activity itself.<sup>36</sup>

For Thompson, then, the conscious self is enacted rather than being a substantive ego over and above or in any way separate to the performance of that self, through self-specifying and self-designating processes.<sup>37</sup> A self-specifying consciousness is one that retains “the feeling of the body from within,” as something separate to the surrounding environment.<sup>38</sup> Single-cell organisms such as bacteria are self-specifying to the extent that they comprise a “collection of processes that mutually specify each other so that

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<sup>34</sup> Thompson worked closely for years with Francisco Varela, discussed in Chapter 2, and like Varela is a proponent of neurophenomenology.

<sup>35</sup> Evan Thompson, *Waking, Dreaming, Being: Self and Consciousness in Neuroscience, Meditation and Philosophy* (New York: Columbia University Press, 2014), 361.

<sup>36</sup> Thompson, 363.

<sup>37</sup> Thompson, 356.

<sup>38</sup> Thompson, 336.

they constitute the system as a self-perpetuating whole in relation to the environment.”<sup>39</sup> A self-designating consciousness, on the other hand, is something more than a “unique sensorimotor perspective”; rather it is able to “attend to its changing experiential states and conceive of itself as the subject of those states.”<sup>40</sup> According to Thompson, this does not mean that the self-designating consciousness is something separate and discrete from the process of self-designation itself. While both Thompson and Hofstadter consider the conscious self as deriving from complex material processes, for Thompson, contrary to Hofstadter, it does not necessarily follow that it is an illusion.

My aim here is not to prove that either view is more correct, rather to illustrate the tension that exists in philosophical arguments around definitions of consciousness and the processes from which it emerges. It is this tension that I argue is reflected in Fichou’s installations of *The Artist*, where the video feedback process is presented alongside the patterns that emerge from it and juxtaposed with the selection of artefacts already discussed. Such a reading does, of course, require an appreciation of video feedback as a metaphor for human consciousness. I have shown earlier in this chapter how both Peter Donebauer and myself understand it as such, and Hofstadter draws the same analogy when he likens the patterns that result from a video feedback system with the patterns of thought that comprise human consciousness, describing both as emergent phenomena that arise from the operation of fundamental, recursive physical processes.<sup>41</sup>

A keen experimenter with video feedback,<sup>42</sup> Hofstadter explains that while he has only a vague appreciation for the physics of the process, he possesses an intuitive understanding of how to induce complex patterns on the screen,<sup>43</sup> so instead of trying to understand the microprocesses comprising its existence, he has come to accept video feedback at the level of emergent phenomena.<sup>44</sup> Just as with video feedback, where the

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<sup>39</sup> Thompson, 325.

<sup>40</sup> Thompson, 344.

<sup>41</sup> Hofstadter, *I Am A Strange Loop*, 65–77.

<sup>42</sup> The cover of *I Am a Strange Loop* shows the results of one of Hofstadter’s experiments with video feedback, his hand in the foreground and a multicoloured, galaxy-like spiral in the background.

<sup>43</sup> Like Hofstadter, I describe my working knowledge of live video feedback as intuitive.

<sup>44</sup> Hofstadter, *I Am A Strange Loop*, 68.

origins of the emergent patterns are practically inscrutable due to the sheer number of recursive loops that comprise them, the origins of conscious experience are obfuscated not only by the complexity of the physical feedback process that constitute it but because of the number of times these processes recur. The inability to completely grasp the way a video feedback loop can create complex structures thereby provides a robust metaphor for the as yet unexplained way that the feedback processes that exist within human beings lead to human consciousness. Yet Hofstadter draws a significant distinction between video feedback and human consciousness even as he uses one as an analogy for the other. What distinguishes human consciousness from the self-referential video feedback loop is that we possess memories.

According to Hofstadter, the process of human perception involves a multidirectional flow of signals emanating from both sensory input and collections of symbols or concepts stored in memory. These concepts become nested within others to form complex hierarchies of concepts in order to create a working model of the external world. What is more, when our perception is turned inward, toward ourselves, we “produce a self-model that is extraordinarily deep and tangled.”<sup>45</sup> A video feedback system, in contrast, does not perceive at all, it can only receive an image and send that same image back to itself in a recursive loop. Even though this process can produce emergent patterns, the video feedback loop does not possess a repertoire of triggerable symbols with which to relate them, it can only refer to itself.<sup>46</sup> Nonetheless, as stated earlier with regard to *Emergent*, the forms that emerge with each consecutive video feedback loop change even as they retain part of their previous form, which is similar to the way the moments we experience persist in short-term memory alongside our present passing perception. Even though video feedback is not a perfect correlate for human consciousness, then, artists persist in engaging with the metaphor in their work.

Fichou draws an analogy between human perception and video feedback in a diagram installed on one of his panels alongside *The Artist*. The diagram shows a video camera and a screen set up in a feedback loop: a picture of an eyeball is attached to the

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<sup>45</sup> Hofstadter, *I Am A Strange Loop*, 86.

<sup>46</sup> This fact is apparent in *Emergent*, where the viewer sees three separate video channels, all the outcomes of similar video feedback systems yet each displaying markedly different visual manifestations.

video camera and a picture of a brain is linked to the screen. The feedback loop is bounded by arrows and labelled “space-time compression” and within these bounds sitting between camera and screen is handwritten text that reads:

The images construct themselves on both sides of the device... simultaneously, and yet one always alternating between being the past or the future of the other. When the eye captures the world, the brain record it. [sic] This system works in a similar fashion.<sup>47</sup>

In this passage of text, Fichou correlates the video feedback loop with the feedback between eye and brain that comprises human visual perception. He echoes Hofstadter’s distinction between the two systems elsewhere within the diagram when he writes: “The camera and the monitor act like two mirrors facing each other — no consciousness just light and speed.”<sup>48</sup> Fichou reinforces this distinction through his choice of sealing the feedback machine within the plexiglass casing, presenting *The Artist* as an autonomous machine that feeds on itself without any reference to the world beyond, nor indeed to any internal repertoire of symbols. While Fichou makes it clear that the feedback machine is not conscious, he nonetheless encourages the viewer to see *The Artist* as a metaphor for the human visual system of perception and, by extension, as a metaphor for consciousness itself. The metaphor is reinforced as the viewer is drawn into the complex process of sense-making described above, where they are driven to reconcile the video feedback process with the live outcome and the assortment of adjacent artefacts. In this way the viewer is led to understand that consciousness, and by extension the conscious self, cannot be divorced from the processes which underlie its emergence, and that this self is no more an illusion than the everchanging patterns that emerge from *The Artist*.

Understood as a process, rather than an entity separate from our physical being and the environment in which we exist, it is difficult to agree with Hofstadter that the conscious self is an illusion. Thompson draws a useful analogy between the conscious self and an image appearing in a mirror to argue against the conscious self as illusion.

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<sup>47</sup> Fichou, *Untitled Image*.

<sup>48</sup> Fichou, *Untitled Image*.

He explains that while a mirror image depends on the existence of a mirror and an observer for its existence, that image is not the mirror itself nor even composed of the same substance as the mirror. Nevertheless, as Thompson puts it,

the mirror image, though observer-dependent, isn't a subjective illusion. So too the self, though mind-dependent, isn't a subjective illusion... the illusion — or delusion — is taking the self to have an independent existence, like taking the mirror image to be really in the mirror.<sup>49</sup>

Similarly, the patterns that emerge from the video feedback loops used in both *The Artist* and *Emergent* are not illusions, nor could they exist independently from the recursive processes that produce them. If, like video feedback, consciousness is an ongoing process, a continuum of experience based on recursive processes, it stands to reason that it cannot be divided into discrete moments in time. Yet this is what video technology tends ordinarily to encourage: the division of lived experience into segments of recorded time. The more we identify with time as segmented into the narratives of cinema, television, and snippets of human experience on YouTube, Instagram or TikTok, the more we tend to identify with our own experience as divisible and/or determined. When the video camera is turned onto its own output in artworks such as *Emergent* and *The Artist*, it becomes an indivisible loop from which complex, unpredictable patterns emerge that can be understood as metaphors for the way our consciousness emerges from similar processes of feedback.

Consciousness, whether it lay dormant in inert matter and was liberated as the result of an originating impetus or whether it is an epiphenomenon of the physiology of the nervous system, emerges through the protracted interplay of movement and matter, and each of us knows it intimately in our every waking experience. Yet we only know it at the level at which it presents itself to us, much like the patterns that emerge from video feedback. The patterns that emerge from *The Artist* and *Emergent* are practically impossible to reconcile with the microprocesses that are occurring within the video feedback loops that create them on the screen. Just as with philosophical arguments

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<sup>49</sup> Thompson, *Waking, Dreaming, Being*, 365.

around the nature of our conscious sense of self, there exists a tension within both artworks between the emergent phenomena and the underlying processes from which they arise.

The camera in the live feedback loop of *Emergent* is at full zoom, presenting the limit as to what it can reveal about the forces at work within the technology on which it relies. Even so, it does not allow significant insight for the viewer into the detail of the microprocesses involved within the loop. The accompanying recordings of feedback loops in *Emergent* do not engender a detailed intellectual understanding of exactly how the patterns of the live feedback loop come to be, nor do the array of static artefacts alongside *The Artist* elucidate exactly how the patterns emerge from the processes occurring within the feedback machine.<sup>50</sup> For Bergson, the world is in process, life is movement — change — and in order to truly know it we must insert ourselves into duration. Intuition is his method for doing so, by which he means “the *sympathy* by which one is transported into the interior of an object in order to coincide with what there is unique and consequently inexpressible in it.”<sup>51</sup> It is this diversion, from intellect — with its tendency to divide — to intuition, that is possible through an encounter with *Emergent* and *The Artist*, where the viewer is drawn into an experience of the indivisible time of the feedback loop, rather than an intellectual understanding based on division.

My intention with *Emergent*, and I would suggest Fichou’s with *The Artist*, is to divert the attention of the viewer away from matter, represented by the artefacts, the cameras and screens — divided and static — and refocus it intuitively on the movement, the emergent phenomena that is constantly changing and indivisible into any one element of the process that causes it. Bergson says,

To think intuitively is to think in duration... Intelligence ordinarily concerns itself with things, meaning by that, with the static, and makes of change an accident which is supposedly superadded. For intuition the essential is change: as for the thing, as

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<sup>50</sup> Even if they provoke the profusion of tangential trains of thought described earlier.

<sup>51</sup> Bergson, *The Creative Mind*, 190 (emphasis in original).

intelligence understands it, it is a cutting which has been made out of the becoming and set up by our mind as a substitute for the whole.<sup>52</sup>

With these words, Bergson encourages us to nurture intuition, through which we might attain absolute knowledge of things in duration, as opposed to the relative knowledge that is afforded by conscious intelligence that divides time as it does matter. Where the video camera and television screen are normally tools with which to cut or divide our time in the world, in the experience of both *The Artist* and *Emergent* they become tools to place us back into duration.

In this chapter I analysed the processes used and aesthetic outcomes displayed in my work *Emergent*, describing how it uses contemporary video technology embedded within smartphones in a manner contrary to its usual function of dividing time. I then showed how Bergson's concept of the *élan vital* is mirrored in contemporary scientific thought where novelty emerges from processes of feedback in time. Artists including Peter Donebauer and myself recognise similar emergent phenomena in video feedback and consider it as a metaphor for human consciousness. Through a discussion of the contrasting views of Douglas Hofstadter and Evan Thompson, I elucidated the tension within philosophical arguments around the nature of the conscious self and showed how this tension is reflected in Marc Fichou's installations of *The Artist*. Finally, I explained how the live video feedback loops in *Emergent* and *The Artist* can be understood as metaphors for human consciousness and how each work draws the viewer into an intuitive experience of indivisible time. In the next chapter I describe how philosopher Michel Serres extends Bergson's concept of duration as indivisible time to regarding time as multitudinous, and argue that two contemporary artworks made by shaping video feedback reflect aspects of each philosophy.

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<sup>52</sup> Bergson, 39.



## Chapter 4

### Saturn Return: Multitudes of Time

In this chapter I argue that two recent artworks that use video feedback as source material, my own *Saturn Return* (2019) and Barbara Doser and Hofstetter Kurt's *Dream'sdreams* (2007), through divergent processual and aesthetic strategies reinforce the complementary philosophies of time of both Henri Bergson and Michel Serres. I demonstrate the ways in which Serres embraces Bergson's philosophy of time as indivisible and builds upon it, conceiving of things and events in the world as multitemporal, each vibrating with its own confusion of rhythms. Then I outline Serres' position that in order to reconcile our seeming defeat of time due to lightning-fast contemporary communication with a relatively recent understanding of humanity's vast evolutionary history, we must reassess our understanding of time as percolating rather than flowing. Finally, I explain how both Doser and Kurt's and my own use of video feedback to construct large scale immersive audio-visual experiences encourage an appreciation of time aligned with these philosophies, where time is not only indivisible, but manifold and more complex than any linear, homogenous conception of it might allow.

#### 4.1 Serres and Bergson: Knowledge and Time

Philosopher Michel Serres conceives of time in numerous ways, developing an extraordinary variety of metaphors with which to describe it. He equates it at different times with weather, chaos, and noise. For Serres, time percolates, is sporadic, "a badly stitched tatter, it passes, loose, a mosaic;"<sup>1</sup> far from homogenous or linear, time flows

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<sup>1</sup> Michel Serres, *Genesis*, trans. Genevieve James and James Nielson (Ann Arbor, MI: University of Michigan Press, 1995), 115.

“according to an extraordinarily complex mixture.”<sup>2</sup> He draws from a range of theoretical frameworks, including topology, fluid dynamics and combinatorics to support his philosophy of time. Where Bergson argues against an understanding of time as a function of homogenous space, Serres reconceives both, rejecting geometric space in favour of topological space and rethinking classical linear time as “pure multiplicity.”<sup>3</sup> His extensive oeuvre of writings on and around time are not easily digested and even less easily condensed into a coherent summation. Accordingly, he argues that his readers should embrace a confused knowledge, rather than a concise one.<sup>4</sup>

Like Bergson, who draws a distinction between knowledge based on intellect and that based on intuition, Serres differentiates between knowledge that is the result of analysis — one that divides and separates — and knowledge that embraces confusion. He credits Bergson with the invention of the latter type of knowledge in the shape of “a clepsydra with several entry points... the precise practice of confusion... and solution. The intimate fusion of one thing into another, of one flow into another.”<sup>5</sup> A clepsydra is an ancient water clock that measures time based on the amount of water that flows unidirectionally and consistently into or out of a container. By invoking the image of a clepsydra with multiple entry points, Serres describes the type of knowledge that absorbs manifold scales of time flowing all at once, the kind of knowledge upheld by Bergson, arrived at through intuition. The ‘solution’ Serres mentions is a reference to Bergson’s oft-quoted description in *Creative Evolution* of his experience of waiting for sugar to melt in water, and how it cannot be equated with divisible or mathematically homogeneous time because it coincides with his impatience. Bergson explains how this time cannot be abstracted from the lived experience of waiting for the dissolution of the sugar crystals into the water: “It is no longer something *thought*, it is something *lived*. It

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<sup>2</sup> Michel Serres with Bruno Latour, *Conversations on Science, Culture, and Time*, trans. Roxanne Lapidus (Ann Arbor, MI: University of Michigan Press, 1995), 57.

<sup>3</sup> Serres, *Genesis*, 6.

<sup>4</sup> I will refer in the foregoing, to several of his publications, although time will appear, as Hamlet or Deleuze rightly contend, out of joint. I will not follow a chronological progression in terms of Serres’ thought; rather I will attempt one that is in line with his theory of time as nonlinear and lacunary.

<sup>5</sup> Michel Serres, *The Five Senses: A Philosophy of Mingled Bodies*, trans. Margaret Sankey and Peter Cowley (London: Continuum, 2008), 168.

is no longer a relation, it is an absolute.”<sup>6</sup> Absolute knowledge, for Bergson, is acquired through intuition, which, as Gilles Deleuze puts it, “presupposes duration.”<sup>7</sup>

The concept of qualitative, or continuous, multiplicity is at the heart of Bergson’s duration. He distinguishes between two forms of multiplicity: those that are discrete, like “material objects counted in space”; and those that are continuous, our “conscious states, not countable unless symbolically represented in space.”<sup>8</sup> Where one represents (quantitative) differences of degree, the other represents (qualitative) differences in kind. This is the logic through which Bergson is able to say that there exists “below the numerical multiplicity of conscious states, a qualitative multiplicity.”<sup>9</sup> The problem, according to Bergson, is that we fail to differentiate the two, dividing up our conscious states as if they existed in homogenous space, numerous and discrete instead of realising the true nature of their multiplicity. Deleuze clarifies this true nature succinctly as follows:

In reality, duration divides up and does so constantly: that is why it is a *multiplicity*. But it does not divide up without changing in kind, it changes in kind in the process of dividing up: That is why it is a nonnumerical multiplicity, where we can speak of ‘indivisibles’ at each stage of the division. There is *other* without there being *several*; number exists only potentially... A nonnumerical multiplicity by which duration or subjectivity is defined, plunges into another dimension, which is no longer spatial and is purely temporal.<sup>10</sup>

Serres sympathises with Bergson’s notion of duration but rejects his dichotomy between space and time and instead recouples them through his philosophy of confusion. As literary professor and Serres scholar Steven Connor puts it, “where Bergson attempted to make a clean break between the fixative illusions of spatial thinking, in favour of a thought in motion, Serres offers ways of thinking time spatially and morphologically.”<sup>11</sup>

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<sup>6</sup> Bergson, *Creative Evolution*, 13 (emphasis in original).

<sup>7</sup> Gilles Deleuze, *Bergsonism*, trans. Hugh Tomlinson and Barbara Habberjam (New York: Zone Books, 1991), 31.

<sup>8</sup> Bergson, *Time And Free Will*, 85.

<sup>9</sup> Bergson, 128.

<sup>10</sup> Deleuze, *Bergsonism*, 42–43 (emphasis in original).

<sup>11</sup> Steven Connor, “Topologies: Michel Serres and the Shapes of Thought,” *Anglistik* 15 (2004): 107.

Serres recognises that “since the time of Bergson's thesis, geometries, and with them, spaces, have proliferated. We no longer see why the continuous should be alien to them, why it should be necessary to classify it with time.”<sup>12</sup> Indeed, Serres sees time, and space for that matter, as far more complex than Bergson supposed. Unlike Bergson, who argued his entire life against a classical understanding of time based on the geometry of space, Serres asserts, instead, that “We no longer inhabit geometry, the Earth or measurement, but a topology without metric or distance, a qualitative space.”<sup>13</sup> Sidestepping Bergson's conceit entirely, he argues that time and space cannot, in fact, be torn asunder, rather, time should be thought of “as a node or interchange or confluent of several times, each of which can be understood spatially.”<sup>14</sup>

For Serres, then, our experience of time is less like geometry, where space is accounted for using standard measurements, and more like topology, that measures relative proximity. He uses the example of a handkerchief to explain the difference between the two approaches. When ironed out flat, the surface of the handkerchief can be marked with clearly defined points, the distances between them fixed and unchanging. But the same points on the same handkerchief crumpled into a pocket will be much nearer to one another, perhaps superimposed. According to Serres, our experience of time “resembles this crumpled version much more than the flat, overly simplified one.”<sup>15</sup> Following this logic, events and objects are proximate not due to their particular position in a linear temporal progression but due to the way time is folded and layered within certain experiences involving multiple objects and events. Serres' idea of time as layered becomes important to my reading of both *Dream'sdreams* and *Saturn Return* later in this chapter. Both artworks are comprised of multiple layers of shaped video feedback that I argue can be understood to reflect the multitude of rhythms that Serres' claims comprise our conscious experience of time. First, however, it is necessary that I explain how Serres understands the way that multiple rhythms coalesce to produce the arrow of irreversible, indivisible time.

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<sup>12</sup> Serres, *The Five Senses*, 76–77.

<sup>13</sup> Michel Serres, *Hominescence*, trans. Randolph Burks (London: Bloomsbury, 2019), 154.

<sup>14</sup> Serres, *The Five Senses*, 168.

<sup>15</sup> Serres and Latour, *Conversations on Science, Culture, and Time*, 61.

## 4.2 Multitudes of Time

For Serres, objects and events, as “polychronic, multitemporal,” gather together numerous scales of time.<sup>16</sup> Early in *The Incandescent*, a compendium that represents the culmination of his life’s work, Serres provides a poignant illustration of his conception of time as multiplicity. He describes his perception of watching his granddaughter playing with a doll in a valley near a hundred-year-old family house framed by distant mountains. He explains how there are multitudes of time within this vista: the present passing of his granddaughter’s play, the much more gradual dilapidation of the house and the extremely slow motion of the mountain range in the distance represent a “tiered series of clocks.”<sup>17</sup> Each object and event within his field of vision contains its own rhythm, or vibration. A problem arises, according to Serres, because we ordinarily understand time in terms of the closure of these rhythms, rhythms by which we have learned to measure time.

Rhythms surround us in nature: cycles of birth and death, circadian rhythms that occur within the cells of our bodies, the rhythms of the tides, the orbit of the moon and those of the planets beyond. Once each cycle is complete its duration is reduced to nothing — the measure has been spent — and by counting the measure of the complete cycles or rhythms of life we nullify time so that we may dominate and master it. Because we ordinarily measure time by these rhythms, we destroy it. It is in this way, according to Serres, that we “confuse nature and the measurement of time,” but nature is not the measurement of time, it is the unfolding of events.<sup>18</sup> Yet the rhythms are what we remember: our memory is full of cycles and rhythms that are complete and this is why Serres can say that “memory can only become attached to the reversible.”<sup>19</sup> That which can be reimagined can be rewound; we are able, in memory, to recount experiences we have endured in any order whatsoever. As with video, we can scrub backward and forward through past rhythms in memory, but only because they have completed themselves. We can deduce the cause from the effect by thinking backwards through a

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<sup>16</sup> Serres and Latour, 60.

<sup>17</sup> Michel Serres, *The Incandescent*, trans. Randolph Burks (London; Bloomsbury, 2018), 5.

<sup>18</sup> Serres, 224.

<sup>19</sup> Serres, 224.

series of events that led to certain outcomes. When we are in the midst of them, however, they are asymmetrical, irreversible: in the present passing moment we are beholden to the intractable arrow of time.

It is through an understanding of combinatorics, the mathematical study of permutations of sets of elements, Serres claims, that we are able to appreciate time as irreversible. Because of the intense confusion of the cacophony of rhythms abounding within ourselves, our memories, the world and the universe at large, it is impossible to untangle them. Taken in isolation, each of the vast multitude of contemporaneous rhythms occurring at any given time — from planetary orbits to human heartbeats — may well seem reversible, but if arranged together in infinite numbers and set in motion, it is extremely unlikely that the same combination will occur again. It is the intricate and turbulent way in which the rhythms of the world coalesce that produces the irreversibility of time (as pure multiplicity). As Serres puts it:

Nothing beats or revolves anymore; everything becomes other and therefore changes and transforms: so the sequence of counts and time flees, irreversible. Combinatorics thus produces an arrow: the genome contains time, endowed with its direction.<sup>20</sup>

For Serres, combinatorics proves the irreversibility of time and the aperiodic nature of the human genome, collectively shared, yet unique to each individual, is the key to understanding its direction. He argues that time accumulates in the sequences of our DNA that launch life — an asymmetrical rhythm that is, rather than a cycle that is complete, a process that is ongoing. This is what he means when he says that time percolates, “sometimes filtering through and sometimes not. The structure of percolation helps us to understand memory.”<sup>21</sup> Serres speaks here not of individual memory, but the collective memory of the human species compressed into the double helix of our DNA. The human genome, according to Serres, contains the memory of a practically unimaginable evolutionary journey that has resulted in the present (still passing) context, toward which I will now turn.

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<sup>20</sup> Serres, 227.

<sup>21</sup> Serres, *The Five Senses*, 179.

Serres describes a paradoxical contemporary context where, due to technology, time has seemingly, practically, been defeated, while the full extent of our evolutionary history has only just come into focus. Lightning-fast communication allows us to synchronise our present with that of others across vast distances. At the same time, we now — in only the last handful of generations — understand that we live but a fragment of a universal history going back fifteen billion years or more. Whilst everything happens now at the speed of light, through satellites and fibre, the extent of our history has lengthened almost infinitely. Serres argues that these circumstances require us to reconceive time to account for these disparities in order to restore balance to our conscious experience. Where once we stretched our imaginations to include the lifetimes of our mothers and grandmothers, we now must extend our “temporal intuition” in entirely unimagined ways.<sup>22</sup> As he puts it: “We easily adapted to the lightning-fast without seeing that we needed to, as a counterbalance, bring our knowledge, consciousness and perception into line with this slowness.”<sup>23</sup> Part of his solution is to appreciate the multitemporal nature of experience, to acknowledge — and reckon with — the multitude of rhythms inherent in things and events that surround us, and to understand that the DNA that launches each of us into existence is the result of an irreversible process of evolution that stretches back across incomprehensible epochs.

Having elaborated the way that Serres adapts Bergson's philosophy to develop and expand the idea of time as multiplicity, I now turn toward two artworks for which video feedback is shaped to create experiences that provoke appreciations of time that chime with those of both Bergson and Serres. *Dream'sdreams* and *Saturn Return* each provide an experience of time as multiple yet indivisible: a qualitative confusion of rhythms. Both artworks were created using a series of intricate post-production processes to shape raw video feedback into large-scale immersive audiovisual installations. *Saturn Return* presents slow-motion video feedback — layered, shaped and blurred — projected along with an audio channel of low frequency harmonics that change depending on where the viewer is in the installation space. Slowly emerging

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<sup>22</sup> Serres, *The Incandescent*, 106.

<sup>23</sup> Serres, 105.

symbols of a sphere and hexagon represent the competing rhythms that we perceive in the world around us, imagine in the world beyond us and that we feel within ourselves, all comprising our conscious experience of time. Viewers of *Saturn Return* are invited into a contemplative mode of experience evoking multitudinous scales of time. In contrast, *Dream'sdreams* is a cacophony of light and sound that destabilises the perception of the viewer. Immersed in a fast-moving rhythmic interaction of sight and sound, normal perception is undermined in order to create a feeling of confusion, described by the artists as 'synesthetic'. I argue that *Dream'sdreams* creates an experience of time as all at once, as viewers are enveloped in the chaotic whirl of video feedback.

#### 4.3 Chaos Reigns: *Dream'sdreams*

*Dream'sdreams*, by Barbara Doser and Hofstetter Kurt as Parallel Media, was originally installed as a single-screen projection and exhibited at the International Rotterdam Film Festival in 2007. A 2011 iteration, at Kro Art Contemporary in Vienna, saw the video projected onto semitransparent material draped over a rectangular structure approximately two metres high and three metres wide. In the forgoing discussion, I will be referring to the 2015 iteration of the work, installed at Künstlerhaus in Vienna as part of the exhibition *Body Interface*. (fig. 16) For this instantiation, the single-channel video was projected onto two five metre diameter balloons installed side by side in a large warehouse space, and accompanied by a stereo audio soundtrack, looped indefinitely. A series of circles and lines first flow across the spheres, rushing by like compressed waveforms or some unknown or alien notation. The movement is rapid and impossible to make sense of, the video warped out of its original two-dimensional aspect ratio across the two spheres. The accompanying sound is a high monotone synthesised tone and a trilling reminiscent of the sound of an excited flock of birds or water rushing by. The lines and circles change direction, moving diagonally and the high synth tone shifts to a much lower frequency, more aggressive, before the direction of movement changes again to vertical, from the bottom to the top of the screen. As the formations become more complexly woven together, deconstructed and reconstructed, one might think they begin to see letters of the roman alphabet rushing by, maybe words. The lines and



circles move at such speed that at times they blur together and at others seems to be superimposed on each other, creating the feeling of time as compressed. As the speed increases the sound rises in volume, and just as the numerous layers of lines and circles become almost completely blurred due to the rapid speed at which they are moving, the image cuts out to white, the accompanying audio dropping back to the high rapid trilling as the white slowly fades to black. The scale of the work creates an immersive experience for the viewer as they are dwarfed by the maelstrom of fast-moving lines and circles.

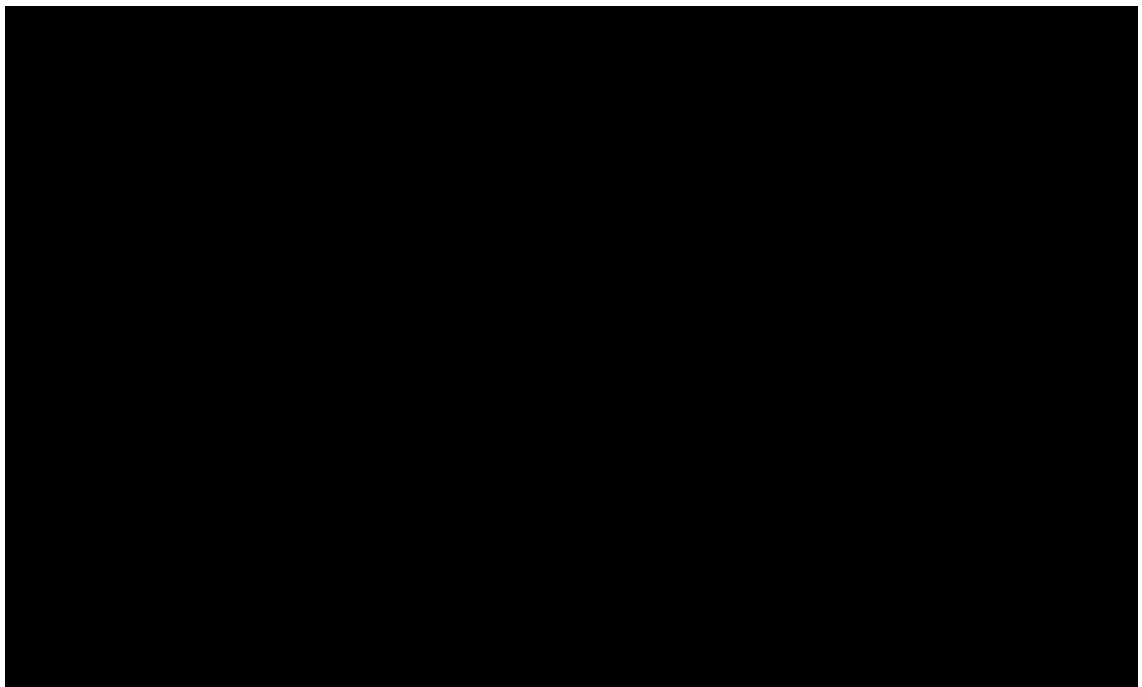


Figure 16: Barbara Doser and Hofstetter Kurt, *Dream'sdreams* (2011), installation view at *Body Interface*, 4/9/2015 – 18/10/2015, Künstlerhaus, Vienna, [https://sunpendulum.at/parallelmedia/Kuenstlerhaus-2015/dreamsdreams-Barbara\\_Doser&Hofstetter\\_Kurt\\_2015.html](https://sunpendulum.at/parallelmedia/Kuenstlerhaus-2015/dreamsdreams-Barbara_Doser&Hofstetter_Kurt_2015.html).

Barbara Doser is an artist who came to video feedback by chance in 1993 and has been working with it artistically ever since. Doser sees video feedback as “something evolutionary... as both an analogy and contrast to nature,” echoing the tension I argue exists in Fichou’s *The Artist*, where he juxtaposes images of nature with a direct video feedback system.<sup>24</sup> Both Doser and Fichou, amongst other artists cited previously in this

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<sup>24</sup> Barbara Doser, “Video Feedback — Lyricism in Patterns of Light,” in *Barbara Doser: Video Feedback — Lyricism in Patterns of Light*, trans. Steve Wilder, ed. Zwei Kongruent Null (Vienna: ST/A/R Printmedium Wien, 2010), 21.

thesis, are aware that the forces in video feedback mirror the natural evolutionary forces in our known universe, in that it is a process through which something truly novel can be created. Doser's source material for *Dream'sdreams* is the result of indirect video feedback, where the camera is pointed at the edge of the monitor that forms part of the video feedback loop.<sup>25</sup> In her book, *Barbara Doser: Video Feedback — Lyricism in Patterns of Light*, she describes a number of post-production techniques she applied to the 1 minute, 55 second source file in the process of creating the work, including undisclosed methods for re-encoding video, repeated recording of the source material on a monitor with changed vertical frame rate, and the separation and overlaying of upper and lower halves of the frame.<sup>26</sup> Kurt's audio track for *Dream'sdreams* is composed of his so-called 'Moebius sounds' that are palindromic in nature, meaning they sound exactly the same played forward or backward. The track is, however, asymmetrical from beginning to end, unlike the sounds used to create it.

*Dream'sdreams* works as a series of crescendos and releases, disorienting the viewer and then leaving them in a present moment full of empty white light. In this way, moments so full of chaotic movement and sound become suddenly serene and viewers might appreciate their breath, or breathlessness, as they take in the physical context of the work — two enormous spheres. The spheres can be understood to represent human eyeballs and by extension the human visual system, but without pupils they are unable to absorb light, instead acting as surfaces onto which light is projected. Doser and Kurt describe the experience of the work as a “multidimensional event,”<sup>27</sup> hinting at a reference to string theory, which aspires to a cohesive mathematical model that describes all of the fundamental forces in the universe.<sup>28</sup> The fundamental elements of string theory one dimensional objects that are either strings or loops. The lines and circles in *Dream'sdreams* can be considered as visual representations of these theorised fundamental elements of the universe. Across the giant spheres dash the loops and strings of an unproven scientific theory that aspires to describe the entire universe — its

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<sup>25</sup> Doser also uses a video mixer to exercise fine control over various parameters including colour desaturation.

<sup>26</sup> Doser, *Barbara Doser: Video Feedback*, 154.

<sup>27</sup> Barbara Doser and Hofstetter Kurt, *Dream'sdreams*, accessed 24 August, 2019, <https://www.sunpendulum.at/parallelmedia/dreamsdreams/index.html>.

<sup>28</sup> See Elias Kiritsis, *String Theory in a Nutshell* (Princeton, NJ: Princeton University Press, 2007).

pasts and its futures across multiple dimensions — in the language of mathematics, the symbols of science. With *Dream'sdreams* I suggest the artists imagine a quantum view of these fundamental physical elements of the universe from *within* the theorised substrate of spacetime itself, presented as a chaotic multitude of rhythms.

Doser claims that “rhythms are the creators of time and space, at least for the individual,” and that the rhythms of *Dream'sdreams* are designed to create a specific experience of time for the viewer.<sup>29</sup> Both Dosser and Kurt suggest that “cognitive abilities like conceptualizing and causal logical recall are not useful” when experiencing *Dream'sdreams*, demonstrating their intention to influence viewers’ temporal consciousness.<sup>30</sup> The idea that causal logic is not useful within the experience implies that the usual expectation of cause and effect — an expectation based on our ordinary understanding of time as irreversible — is intended to be challenged and destabilised when immersed in the installation. At particular intervals during the work the strings and loops can be perceived as moving from left to right horizontally, vertically or diagonally; at other times it is impossible to tell in which direction they are moving. In some moments they appear to be moving in all directions at once in an intense confusion of rhythms where time seems paradoxically both reversible and irreversible in accordance with Serres’ understanding of it. This tension between concepts of time as both reversible and irreversible is also embedded in the audio component of *Dream'sdreams*. Kurt arranges his palindromic Moebius sounds in what I describe as a sonification of Serres’ conception of reversible cycles or rhythms of time that coalesce to create the irreversibility of time’s arrow.

Together, Dosser’s shaped video feedback and Kurt’s sonic composition create an experience that resonates with Serres’ philosophy of confusion as well as Bergson’s notion of intuition by distancing, even detaching viewers from their ability to analyse the results of their perception. Bergson and Serres both acknowledge that discrete or relative knowledge based on divisions of space and time conceived as homogenous and uniform remains useful in understanding the world and making choices based on those

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<sup>29</sup> Dosser, “Video Feedback,” 24.

<sup>30</sup> Dosser and Kurt, *Dream'sdreams*.

understandings. Both are equally wary of its capacity to lead to destruction — of time and of nature. Serres, in particular, argues against the unitary, in theory and in practice:

The Universe via entropy, life via inadaptation, cultures via war, empires via the intention to dominate the world after their fashion, everything dies from uniformity. Consequently, beyond a certain size, the homogeneous crumbles and falls, unadapted to largeness and duration; the uniform doesn't hold up in space or persist in time.<sup>31</sup>

Instead, he advocates for time as multiplicity and knowledge as confusion, as do Doser and Kurt with *Dream'sdreams*, enabling viewers to forget themselves, their rationality and their divided states of mind. The artists set out to destabilise the perceptive capacities of the viewer, inviting them into a dream of video turned upon itself, an imaginarium of rhythms. Through the intense bombardment of multilayered, stretched and superimposed strings and loops in *Dream'sdreams*, time is sped up and slowed down, the abrupt cuts to white and fades to black resulting in the feeling of forgetfulness that gnaws at us when sometimes we awake from a dream. The time of dreams is not the time of a divided consciousness; in dreams as Bergson conceives them, “we no longer measure duration, but we feel it; from quantity it returns to the state of quality.”<sup>32</sup> With little recourse to the discernment of quantity in the experience of *Dream'sdreams*, time passes as in dreams: chaotic and indissoluble.

#### 4.4 *Saturn Return*: Scales of Time

*Saturn Return* is a large-scale projection with an accompanying stereo audio track. ([link to video documentation](#)) The video channel is projected at the scale of 5.7 meters wide by 3.2 metres tall. Beginning with a rapid fade up from black to blue, the projection then quickly dips back to black, up to white, back to black and then deep blue all within the first few seconds. These changes in colour, best characterised as a slow flickering or blinking, continue throughout the five-minute duration, extending to various hues of cyan, yellow, orange, green, pink and blue. The video contains no hard cuts and the

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<sup>31</sup> Serres, *The Incandescent*, 218.

<sup>32</sup> Bergson, *Time and Free Will*, 126.

colours cycle smoothly, sometimes dipping briefly to darkness and at others progressing through various cycles of colour at full illumination. A dark band, fluctuating in width, moves slowly up the screen, emerging from the bottom and then disappearing at the top. A small sphere with blurred edges emerges from the centre, growing slowly larger to fill about a third of the screen, flickering in sync with the background. The dark band continues for the duration of the work to move from the bottom to the top of the projection, alternating between the background layer and the foreground sphere. Both layers continually flicker through cycles of colour as the edges of the frame begin to draw inward, first from the sides and then from the corners. As the edges of the frame continue to contract the sphere seems to blend back in with the background for a few moments but then reasserts its shape as the background layer draws in further to reveal the form of a hexagon. The hexagon eventually stops shrinking and remains stationary, framing the sphere in the centre of the screen for some time before the sphere begins to grow beyond the hexagon to fill the entirety of the original rectangular frame of the projected video and the entire video loop begins again. The accompanying audio can be described as low frequency harmonic humming. The configuration of speakers outputting the audio creates an interactive sonic environment of competing standing waves so that each visitor experiences a uniquely turbulent soundscape dependent on their speed and trajectory through the gallery due to the interactions of the frequencies in the space.

*Saturn Return* is the result of shaping a recording of a direct video feedback session using an iPhone camera and a television monitor displaying the camera output streamed over a Wi-Fi network via an Apple TV device. This feedback system is similar to that used for *Emergent*, except the phone was not placed directly onto the screen, rather it was held approximately two centimetres away. The 'slo-mo' function of the smartphone camera was used to capture one minute and thirty-seven seconds of video of strobing colours at 240 frames per second. The rapid strobing evidenced a feedback loop on the edge of chaos, the effects of the competing refresh rates of the television (at 200 hertz), the iPhone (at 60 hertz) and the 240 frames per second being captured. When played back, the file exhibited rapid chaotic strobing through cycles of colour

interleaved with partially dark frames, discernible only by stepping through the file frame by frame. Using Adobe After Effects, I split the source file into two separate video files, one of odd frames and one of even, then slowed them down and applied a gaussian blur to each. After layering the files one on top of the other in Premiere Pro, I applied a 'spherizing' effect to the top layer and a hexagonal shape mask to the background layer before animating the scale of each over time. The audio track is comprised of three uninterrupted sine tones that correspond to the existent frequencies within the video feedback loop: 60, 200 and 240 hertz.

There are a number of things at play relevant to a reading of *Saturn Return* within the context of the preceding discussions in this chapter, including the sphere, the hexagon, and the way they work in conjunction with the flickering rhythms of the work as well as the enveloping sound. I will deal with the sound briefly before moving onto the visual experience of the work. The sound of *Saturn Return* can be understood as a sonic example of the combinatorics described by Serres, where once a number of rhythms — in this case sound waves — are set in motion it is practically impossible to untangle them in the ordinary experience of the work. The dramatic changes in the pitch and volume of the enveloping low frequency humming as the viewer moves through the exhibition space is intended to contribute to a shift in temporal perception. Bergson claims that “we have no interest in listening to the uninterrupted humming of life's depths. And yet, that is where real duration is.”<sup>33</sup> The variant sonic textures operating in the installation of *Saturn Return* work to stir these depths in the viewer, reinforcing their sense of their own body as a centre of indetermination in contrast with the predetermined, looping video channel. In this way viewers are encouraged to appreciate their own subjective duration as they move through the exhibition space.

The sphere that emerges from the flickering, blinking feedback from which *Saturn Return* is shaped, figures as a multitude of possible meanings. All at once it symbolises the emergence of order from chaos, an eyeball, a cell, a molecular particle, a germ, a sun, a moon or planet. Each of these things vibrates with its own temporal rhythm in nature, bound to its own scale of time. Some of these rhythms, such as the

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<sup>33</sup> Bergson, *The Creative Mind*, 176.

moon as it proceeds in its twenty-eight-day orbit around Earth, are familiar to us, they endure with us in our experience as we wonder at the night sky. Others, like the oscillations of a molecular particle or a proton within an atom, we can barely imagine, even if we understand them intellectually.

For Carl Jung, who inspired artists working with video feedback in the 1960s and 1970s, a sphere represents “the totality of the psyche in all its aspects, including the relationship between man and the whole of nature.”<sup>34</sup> Incorporating Jung’s perspective, the sphere in *Saturn Return* can be seen to reference virtually all things simultaneously, representing the multitude of rhythms — seen and unseen — that coalesce to make up the time of our conscious experience. When combined with the dark band that rolls continuously from bottom to top of each layer of *Saturn Return*, however, the sphere can also be understood to represent a specific planetary body and its concomitant rhythms. In and of itself, the dark rolling band calls to mind the so-called ‘banding’ evidenced in photographs and video recordings of analogue video monitors.<sup>35</sup> This banding is anachronistic in the digital context of its creation and display, an unintended reference to obsolete video technology. This chance replica of an analogue artefact misplaced in time encourages a link between *Saturn Return* and video feedback artworks from the 1960s and 1970s born of analogue technologies, situating it within a lineage of artistic practitioners who have made use of video feedback to engage with ideas of consciousness and time. At certain moments during *Saturn Return* the dark band flickers across the centre of the screen behind the sphere, creating the impression of Saturn, replete with its gaseous rings.

Saturn is the second largest planet in our solar system and the farthest planet easily visible with the naked eye. Known to the late Romans as the god of time, Saturn has a prominent and complex history in the mythology and scientific advancement of

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<sup>34</sup> Aniela Jaffe, “Symbolism in the Visual Arts,” in *Man and his Symbols*, ed. Carl G. Jung and M.-L. von Franz (New York: Anchor Press Doubleday, 1964), 140.

<sup>35</sup> Unless the shutter speed of the camera is the same as the refresh rate of the analogue video monitor, bands of darkness are present in photographs where the video image had not yet been constructed. When a video camera records a separate analogue video monitor during playback that it is not synced with, dark bands appear rolling up the monitor.

humanity.<sup>36</sup> The title of the work is an explicit reference to the time it takes Saturn to return to the same point in its 29-year orbit that it occupied at the moment of a person's birth. Astrologers maintain the end of each cycle signals major transitions in each person's life. The first return is said to mark the transition to adulthood, the second to maturity and the third into wise old age. In this way astrologers attempt to make sense of the world and our place in it by relating our own scales of time with that of purportedly influential celestial bodies. However, even though the planets may be predictable in their rhythms, caught in endlessly repetitive loops, our individual and collective human futures cannot be as certainly determined. This tension between the predictability of astronomical cycles and the indeterminacy of our own personal trajectories as we move through the world is eluded to in both the title and the viewers' experience of *Saturn Return*.

The hexagon in *Saturn Return* is revealed gradually as the blinking field of fluctuating background colour begins to recede toward the sphere. The usual 16:9 rectangular aspect ratio of video is slowly destabilised through a continuous, indivisible succession of geometrical forms, from the original contemporary widescreen ratio toward the 4:3 aspect ratio of early television and cinema. As the background layer continues to retract, the projected frame momentarily resembles the shape of photographs mounted in pasted-in black corners in photograph albums of generations past. These ephemeral figurations are implicit references to a history of imaging technologies that each divide time into snapshots or segments, with which I suggest many of us have learned to associate our conscious experience of time. Still shrinking further into an octagon — an obsession of Leonardo DaVinci's and the Christian symbol of rebirth and renewal — the background layer eventually takes its final form as that of a hexagon framing the sphere. Hexagons can be seen at various scales in the natural world, including the honeycomb from which bees hatch and the originating structure of every snowflake that falls. Most significantly for the forgoing discussion, the molecules that comprise the nucleotides that are the building blocks of our DNA are hexagonal.

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<sup>36</sup> Raymond Klibansky, Erwin Panofsky, and Fritz Saxl, *Saturn and Melancholy: Studies in the History of Natural Philosophy, Religion and Art* (Edinburgh: Thomas Nelson & Sons, 1964; Nendeln, Liechtenstein: Kraus Reprint, 1979), 177. Citations refer to the Kraus Reprint.



Taken together in the formation in which they appear in *Saturn Return*, the sphere and hexagon convey dual meanings. (fig. 17) First and foremost, the topological layering of these geometrical shapes hewn out of feedback — the sphere that represents astronomical bodies, the completeness of nature, the human eye, even consciousness itself, bounded by the hexagon that represents the building blocks of DNA — evokes Serres' notion of the human genome as containing the entire history of evolution of life on Earth. The slowness with which these shapes are brought into relief is offset by the blurred digital feedback loop of which they are comprised, combining to produce a metaphor for the reconciliation between the defeat of time resulting from the immediacy of contemporary digital communication and the long history of human evolution that Serres advocates is necessary to restore balance to conscious human experience. In this way, the experience of *Saturn Return* can be understood to afford the extension of our temporal intuition of which Serres speaks.

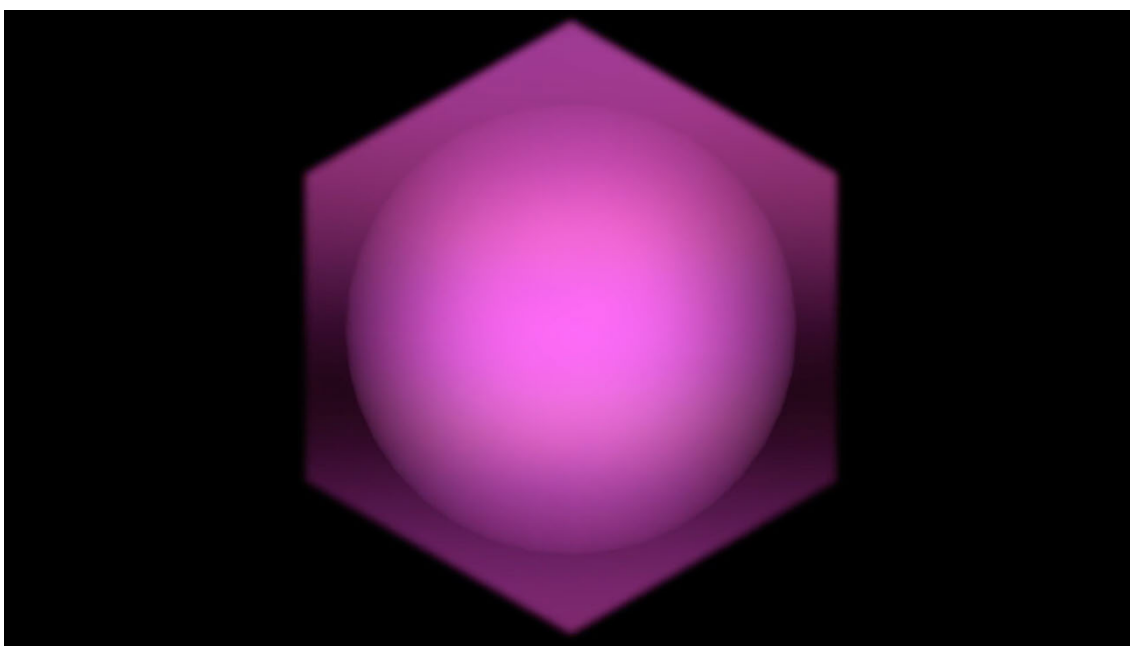


Figure 17: Justin Harvey, *Saturn Return* (2019), video still.

Secondly, in the symbology of science, the image of the pair of shapes equates to the simplified chemical depiction of benzene, produced naturally by volcanoes and forest fires. Those with knowledge of chemistry will recognise the symbol and be aware that benzene is present in gasoline, dyes and pesticides and numerous other products

that contribute to increasing environmental damage caused by humanity and its endless cycles of production.<sup>37</sup> A carcinogenic industrial solvent, benzene was banned by Apple Inc. from use in the final assembly stage of production of the iPhone in 2014, following pressure from activist groups to discontinue its use due to its known link to cases of leukemia. It is still, however, used in the construction of iPhone camera and screen components by subcontractors. That this compound that emanates from such ancient, turbulent rhythms is used for the manufacture of technologies that create untold harm to the planet and its human population is reason enough to provoke the melancholia with which Saturn has long been associated.<sup>38</sup>

*Saturn Return* is a meditation on the competing scales of time that exist within our conscious experience, referencing multiple layers of time within its unfolding: the accumulated time of microsecond loops of video feedback, the time of the sphere — astronomical body, molecule, consciousness — and the time of the hexagon — the structure of the basic building blocks of human DNA. For Bergson, “there is no one rhythm of duration; it is possible to imagine many different rhythms which, slower or faster, measure the degree of tension or relaxation of different kinds of consciousness.”<sup>39</sup> We cannot actually experience the duration of planetary orbits nor the microsecond workings of digital video as millions of pixels are written onto screens every second; we can only imagine these contemporaneously vast and tiny durations. My objective with *Saturn Return* is to draw the viewer into the tensions inherent in its unique combination of synthesized rhythms, to provoke the imagination with the varying scales of time coincident within the work and thereby expose them to an experience of time in contrast to those that video normally present.

In this chapter I explained how Michel Serres extends Bergson’s concept of duration as irreversible and indivisible to paradoxical and multitudinous. Serres says that we forget the arrow of time when we get caught up in the measuring of rhythms

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<sup>37</sup> In 1855, German chemist August Kekulé claimed he had visions of the Ouroboros — the serpent that eats its own tail, symbol of the cyclical nature of time — and awoke to understand the perfectly symmetrical structure of benzene, simplified as a circle enclosed by a hexagon.

<sup>38</sup> See Klibansky, Panofsky, and Saxl, *Saturn and Melancholy*.

<sup>39</sup> Bergson, *Matter and Memory*, 207.

and cycles. By measuring things by their rhythm, the flow of time is stabilised and thus dissolved. By breaking time into discrete periods — symmetrical and reversible — we discount the true nature of the irreversibility and asymmetry of time. Our memory inevitably deals with reversible intervals of duration, just as the orbits of the planets seem to work just as well forward as backward because they are imagined, not remembered, and not endured. But the paths we walk through life are irreversible and as indeterminate as the trajectories of the multitudinous snowflakes that swirl in the frenzy of a blizzard. In both *Saturn Return* and *Dream'sdreams*, through distinctly different artistic strategies of shaping video feedback, viewers are led to either consider the various scales of time that exist all at once in our conscious experience or perhaps even enter into duration itself.

## POSTSCRIPT

*An Impossible Present* has been led by artistic research in the form of experimentation with video feedback and the iterative production of video artworks. Exhibited together as *The Feedback Suite*, the video works *Eye of the Beholder*, *Curtain*, *Emergent*, and *Saturn Return* collectively produce an immersive environment comprised of a confusion of rhythms. The differing abstract visual tempos of each artwork, along with the all-encompassing hum of *Saturn Return*, jointly create a multifaceted meditation on the forces at work within video technology. Every passing moment offers a unique combination of synthesised video artwork intended to induce a shift in the consciousness of viewers in terms of their fundamental experience of time.

Throughout this thesis, I have examined my own and other artworks that incorporate specific kinds of video feedback through the lens of three interpretations and consequent expansions of Henri Bergson's philosophy of time. The driving force behind my research is the conviction that video technology influences our conscious experience of time by dividing it. Video technology has developed from analogue electronic signals capable of replaying the world back to us in real time into binary code that, as multimedia, has become experience itself. I have argued that the artists discussed herein use video feedback to engage with notions of human consciousness and time as experienced through video and that their works express or provoke ideas and experiences of time in contrast to the division of time video would normally represent. My main focus has been a set of artistic practices and aesthetic outcomes resulting from the shaping of direct video feedback. In this postscript I suggest that the thinking I have brought to bear on the artworks I have examined would be appropriate for understanding the way other categories of artworks that incorporate more diverse forms of video feedback in their making or exhibition influence our experience of time.

In 2019, I travelled to South Korea to exhibit *Saturn Return* at ISEA, where it played on a 75 x 16 metre outdoor screen at the Asia Culture Centre in Gwangju. For

reasons beyond my control, the digital video file I had delivered to specification did not play back as expected during the evening that I chose to document the work.<sup>1</sup> Instead it glitched spectacularly as the playback system struggled to instantiate the digital video file on the enormous screen, becoming the one and only screening of *Saturn Return: Glitch Edition* (2019). As I watched, my initial dismay morphed into a mixture of excitement and delight, realising that unintended glitches still have the capacity to disrupt my expectations of the unfolding of digitally mediated time. The experience reminded me that nothing can be completely determined due to the sheer amount of contingency in the world, a sentiment with which Bergson would surely have agreed.

The theme of ISEA 2019 was ‘Lux Aeterna’ (Eternal Light), with sub-themes focused on artistic practices that intersect with fields of scientific research that have grown out of cybernetics, including artificial intelligence, altered reality technologies (virtual reality/augmented reality/mixed reality), and neuroscience. Two exhibited artworks in particular lend themselves to examination through the particular lens I have used throughout this thesis in that they utilise video feedback and deal inherently with the conscious experience of time. The two works, Maurice Benayoun, Tobias Klein and Nicolás Mendoza’s *Value of Values* (2019) and Louis-Philippe Rondeau’s *Liminal* (2018), each make use of imaging technologies — brain-computer interfaces and slit-scan photography respectively — in order to draw participants into their own duration. In the foregoing discussion I briefly describe both works and point to potential lines of enquiry stemming from my research.

For *Value of Values* (2019), conceptual media artist Maurice Benayoun, artist and theorist Tobias Klein, and scholar and multidisciplinary artist Nicolás Mendoza designed a brain-computer interface (BCI) to interpret data gathered from participants using electroencephalography (EEG), a method for recording electronic activity in the human brain.<sup>2</sup> Participants sit in a chair wearing an EEG headband facing a large video

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<sup>1</sup> I was told by the curators the following day that the audiovisual team had failed to adjust the digital playback system during the changeover from the ‘live’ settings required for the opening ceremony earlier that evening to the ‘playback’ settings used for screenings. This resulted in the glitched renditions of each of the works that played on the Media Wall that night, including *Saturn Return*.

<sup>2</sup> Artists began using EEG technology and BCIs at around the same time video art began to be produced in the late 1960s. For *Music for Solo Performer* (1965), Alvin Lucier used his alpha brainwaves to stimulate

screen and are prompted to focus on an abstract concept such as ‘freedom’ or ‘peace’. (fig. 18) A three-dimensional shape forms on the screen — an interpretation of the brainwaves of the participant — and continues to change over the course of several minutes in response to the fluctuations of the participants particular brainwave frequencies. Each participant becomes the owner of their shape and can sell, trade or convert it into cryptocurrency. The artists claim that the work “explores the nexus of human creation, the value systems of artistic production, and our insatiable desire for reified representations of human thought.”<sup>3</sup> It could also be argued that it draws participants into an experience of Bergson’s intuition as discussed in chapter 3, brought about by a surrender to duration, where “one is transported into the interior of an object in order to coincide with what there is unique and consequently inexpressible in it.”<sup>4</sup> In a similar way to *Value of Values*, for *Inter-Dream* (2018), artists Betty Sargeant and Justin Dwyer as PluginHUMAN, use live EEG data and a BCI designed to assist in the preparation of a positive sleep experience. Although *Inter-Dream* was not exhibited at ISEA 2019, the work is relevant here as an example of the way human-video feedback systems are being explored by artists as a strategy to ameliorate the demonstrable disruptive effects of the usage of electronic media on sleep onset and duration.<sup>5</sup> Conceived as an installation that could be viewed by an audience, the work centres around a participant lying on a custom-made bed viewing an artistically designed live translation of several frequencies of their own brainwaves in enclosed goggles. A slightly altered version of the same visuals is projection mapped onto the walls behind the bed so that viewers can contemplate the live feedback loop between human brain and synthesised video.<sup>6</sup>

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percussion instruments, and Nina Sobell used the EEG data of two participants to influence an oscilloscope superimposed upon a live video feed of themselves in *Brainwave Drawing* (1974). Recent advances in EEG technology coupled with lower costs have meant it has been used increasingly by artists over the past decade. For a detailed introduction to the artistic use of EEG and BCI see Anton Nijholt, ed., *Brain Art: Brain Computer Interfaces for Artistic Expression* (Cham, Switzerland: Springer, 2019).

<sup>3</sup> Maurice Benayoun, Tobias Klein and Nicolas Mendoza, “Value of Values,” in *ISEA 2019 Catalogue* (Seoul: Art Centre Nabi, 2019), 132.

<sup>4</sup> Bergson, *The Creative Mind*, 190.

<sup>5</sup> See Nathan Semertzidis et. al., “Towards Understanding the Design of Positive Pre-sleep Through a Neurofeedback Artistic Experience,” CHI '19: Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, May 2019, Paper No. 574, 1–14, <https://doi.org/10.1145/3290605.3300804>.

<sup>6</sup> The power values of alpha, beta, gamma, theta and delta brain frequencies are interpreted as a range of values for colour, shape, contrast and amplitude by a custom real time graphic generation program to create the synthesised visuals. The artists modified the visual output playing in the goggles worn by the participant, removing a particular flare effect designed to manifest in response to increase in overall

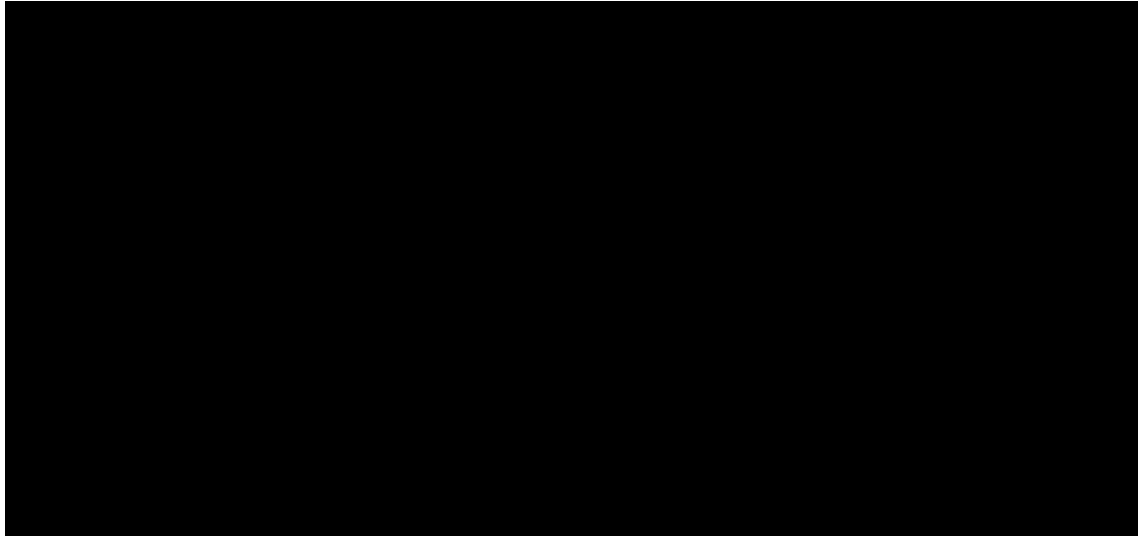


Figure 18: Maurice Benayoun, Tobias Klein and Nicolás Mendoza, *Value of Values* (2019), installation view, 22/6/2019 – 27/6/2019, ISEA 2019, Asia Culture Centre, Gwangju, South Korea, <https://benayoun.com/moben/2019/06/24/value-of-values-at-isea2019-gwangju>.

In both *Value of Values* and *Inter-Dream*, rather than video feedback being a metaphor for the feedback loops of human consciousness, human consciousness becomes a functional part of a video feedback loop. These works and similar works, including *2ch* (2016) by Dmitry Morozov, *Behind Your Eyes, Between Your Ears* (2015) by George Khut and *The Shape of Thought* (2010) by Alan Dunning and Paul Woodrow, are comprised of the kinds of human-video feedback systems envisaged by Eric Siegel back in the 1960s, which he posited as affording the expansion of human consciousness. In each of these works, participants are encouraged to disconnect from the rhythms that both Bergson and Serres describe — the complete cycles of experience held in memory — in favour of the present passing of time as their attention is focused on the evolving visual translations of their brainwaves. The external rhythms one might normally be preoccupied with are replaced by artistic interpretations of the complex rhythms occurring within the brain that combine to form conscious experience. Though Bergson might argue that this division of electrical signals in the brain is exemplary of the division of consciousness he argues against, I would suggest that on the contrary, these artworks would seem to promote the integration of human consciousness into a

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brainwave activity. Its occurrence initiated a positive feedback loop whereby the participant's overall brainwave activity increased, in turn increasing the effects and so on, leading to the collapse of the system.

feedback loop that has the potential to assist them in becoming more attuned to their own temporally indivisible conscious state.



Figure 19: Louis-Philippe Rondeau's *Liminal* (2018),  
installation view, *ISEA 2019*, 22/6/2019 – 27/6/2019,  
Asia Culture Centre, Gwangju, South Korea,  
<http://patenteux.com/wp/portfolio/liminal-en>.

Also on show at ISEA 2019 was artist Louis-Philippe Rondeau's *Liminal*, (fig. 19) for which he employs slit-scan photography, a process whereby a rapid series of narrow image slices are aggregated to form a single image that seems to stretch time out in space. As participants move through a large circular structure, an embedded camera captures slices of their movement, which are stitched together in real time and projected on the adjacent wall such that participants are witness to the live construction of a warped, distended image of themselves. Although technically there is no video in play within *Liminal*, the instant feedback received by participants reads as video as the slices are revealed sequentially in real time to form a seamless composite image before disappearing forever. *Liminal* extends the works of Dan Graham and David Hall discussed in chapter 1, in which the inclusion of viewers or participants in a video feedback loop provokes an encounter with the evident disparity between time as mediated through video imaging technology and as subjectively experienced. The artist



states that their intention is to “reify the boundary between present and past,” but Bergson would say that any attempt to reify this boundary disallows absolute knowledge of the experience.<sup>7</sup> Yet *Liminal* entices visitors to engage with their own duration, even though it is only able to display distorted representations of it. The uncanny, often humorous depictions of their protracted recent past encourage viewers to freely experiment with their movement through the circle during repeated attempts in contrast to the largely automatic way they might normally move through space. In this way *Liminal* encourages considerations of the kind of confusion Bergson purports to exist between space and time. Similar approaches to those I have used in understanding *Liminal* might also be applied to the work of other artists who have engaged slit-scan processes in their work, in particular Bill Spinhoven’s *It’s About Time 2* (1992), for which he developed slit-scan algorithms to warp the image of visitors in a live closed-circuit video loop, and the works of Daniel Crooks, which, although they do not entail video feedback, present abstract slices of time laid out in mind-bending spatial configurations across both still and video images.<sup>8</sup> The artistic uses of slit-scan imaging technology and EEG data in conjunction with BCIs provides fertile grounds for enquiry along the lines I have established in this thesis.

In conclusion I return to the question I posed at the outset of this research project: how do the processes used, and aesthetic experiences produced by artists engaging with ideas of consciousness through video feedback explicate philosophical notions of time? In answering this question, I created four artworks through the iterative shaping of video feedback synthesised using a smartphone camera — a device normally used to divide time through capturing snapshots and video segments of conscious experience — and a separate screen displaying its output. These artworks act as meditations on the ways video feedback may be used to encourage an experience of time other than that which video usually affords. I have argued that they and other artworks that involve the shaping of video feedback provoke an understanding or

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<sup>7</sup> Louis-Philippe Rondeau, “Liminal,” in *ISEA 2019 Catalogue* (Seoul: Art Centre Nabi, 2019), 104.

<sup>8</sup> Artist Golan Levin has assembled an extensive list of artists who use slit-scan technology on his website. “An Informal Catalogue of Slit-Scan Video Artworks and Research,” accessed 12 October 2020, [http://www.flong.com/texts/lists/slit\\_scan/#dcro](http://www.flong.com/texts/lists/slit_scan/#dcro). There may also be an overlap here in terms of the processes I used to make *Curtain*, as iPhone panoramas are essentially the result of a form of slit-scan processing.

experience of time aligned with Bergson's concept of duration. It is through duration that intellect is supplanted by intuition, determined outcomes become uncertain, and novelty is created. For Bergson, "art lives on creation and implies a latent belief in the spontaneity of nature," a nature that has been ravaged by humanity's insatiable desire for control over it through all kinds of division.<sup>9</sup> It is my hope that artists continue to counteract the incessant division of time through video technology in alignment with Bergson's philosophy, which strives to empower the individual, to encourage the view that we are not isolated in humanity, nor are we in our humanity isolated from nature.<sup>10</sup> I firmly believe that if we allow ourselves to be led by our own intuition, rather than an identification with the divisions we see all around us, we can learn to make use of all of the technologies that afford the extension of ourselves across the planet and beyond to create change for the better of us all. Of course, only time will tell.

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<sup>9</sup> Bergson, *Creative Evolution*, 52.

<sup>10</sup> Bergson, 295.

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