

1 Media Temporalities and the Technical Image

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Introduction

This chapter begins with a rather simple observation: that something has changed in the condition of the image. Over the last two decades or so, one type of image has been coming to an end, in place of another. The photographic image and the cinematic image have been replaced by what scholars such as Steven Shaviro (2010) and Shane Denson (2020) call the ‘post-cinematic’ imaging regime, which *includes* the cinematic and photographic, but only inasmuch as they are now seen as data to be computed. Once, the photographic and – by extension – the cinematic was dominant in culture. But now that all images are reduced to digital information processed by computers, the images that are the outputs of programs have become the form on which visual culture is produced, whether in films and television, video games, surveillance, art or advertising. This has implications for the way that we discuss the ontology of images, but also for the conditions of representation, particularly the conditions for the representation of time and by extension the conditions for the possibility of being-in-time.

As is no doubt well known to readers of this chapter, discussions of time, the image, and analogue media have a long history: Marshall McLuhan wrote about the temporality of both older inscription technologies and newer electronic media such as television, Roland Barthes wrote about the temporality of the photograph, Gilles Deleuze the temporality of cinema and Mary Ann Doane and Jonathan Crary have linked the temporality of the image to the discourses of modernity, progress and machines. But now, as computers rather than cameras become the be-all-and-end-all of imaging systems, a new type of temporality has replaced the time-image of cinema and the memories expressed in the photographic.

This chapter continues my recent research on the idea of contemporaneity and what it means to live ‘in the present’ by exploring the conditions for representation produced by such images. Beginning with the media philosopher, Vilém Flusser, I unpack the term ‘technical image’,

which he uses to signify images produced by photographs, films, television and computers. These are images that, according to Flusser, are produced by the automatic function of an apparatus, which breaks images down into smaller elements (pixels, scan lines, frames or grains). Flusser uses this concept to think about the camera as the machine at the start of a new imagining regime, culminating in video and computer-generated images. My use of Flusser's term is slightly different. I would like to use the method for analysing images given to us by Flusser but use the term 'technical image' to unpack and explore the differences between synthetic images – understood as images that present viewers with a unified whole – and images that break a pre-given unity into discrete pixelated elements. I try and go further than Flusser's original formulation of the technical image by tracing its genealogy in much older media used for measurement and the partialisation of events: these are what I refer to in this chapter as *analytical media*. I argue that these types of analytical media, which pre-date the synthesis of the cinema, are now returning in the world produced by technical images. From here, I look at a number of contemporary artworks that further explore what it is to live in the conditions produced by these machines and how this produces a different temporality to that which characterised western modernity.

The conditions for viewing the world through technical images are, according to Flusser, the last in a line of shifts related to techniques of mark making. He writes that first pre-historical man created images to understand the world. A picture of a bull on a cave wall allows you to recognise and hunt one with more precision (Flusser, [1985]2011, pp. 11–12). He goes on to say that historical man then wrote text to explain images, which became non-reversible events in time, where cause followed on from effect. The hunt became a story, a unique event. The world was made comprehensible by projecting onto it the linear structure of the written word. For Flusser, these shifts imply not only a set of key moments in media history, but also a shift in the way time can be represented. In the traditional image, time is circular; the viewer's eyes can wander over its surface, making combinations of objects that are presented all at once. The image is rich with non-linear information flows. The shift to linear writing, for Flusser, then signalled a shift into the time of history, as the eye moves over the text, following a line, with one event following on from another. The shift to the technical image implies a further shift in the way time can be represented and thus understood. No longer gesturing towards the future, no longer a linear progression through information like the printed word, the technical

image emphasises the way events can be deconstructed into smaller parts in the present, based on a program.

Although perhaps a little too linear and a little too neat, the shifts that Flusser describes are useful. This is not because we can, in any way, imagine the entire globe caught up in the same shifts between inscription practices (which Flusser might be accused of), but because they introduce to us, as media theorists and philosophers, a new way to address images. It has to be said that it is doubtlessly true that not all images are now technical and not all writing has been overtaken by computation. In fact, as Friedrich Kittler has argued, the electronic binary computer system still processes strings of information and thus remains based on a type of linear reading. But what Flusser gives us is a way of addressing the forms of thinking and relating to technology that are the result of the admission that humans have become functionaries within image-making systems, rather than its authors or audiences. The insight that Flusser gives us is that the way these apparatuses organise information corresponds to the way we come to know the world that they represent. This occurs once the computer outstrips our perception, once we realise that the image can be deconstructed into parts that are only able to be calculated and hence made comprehensible by computers. As Claus Pias (2003) has argued, when images become a sequence of addresses and values, they are no longer the images they once were. At this stage these new types of images become uncorrelated from human perception (Denson, 2020).

Ever since the invention of traditional images, humans have used them to understand the world. The image on the cave wall allows for the deciphering of hunted animals. As Flusser argues, we know the animals because we have a picture of them. The image becomes projected onto experience; it is used to make the events of the hunt comprehensible. This was extended and made linear with the widespread adoption of written texts. Flusser often suggested that the world itself was chaotic and that to understand it we needed to process it based on a program, whether this be the program of traditional images, the program of writing or the program of technical images. The difference with the technical image is that its program now outstrips the human, no longer including them as authors of the image. This is what leads Flusser to say that, no longer understandable completely, the chaotic events of the world are now only comprehensible if they are first computed, if the program of technical images is projected onto them, which sorts them algorithmically. In this sense, the technical image signals a type of post-humanism, as the image is no longer associated with what the human author or human viewer sees, but rather

determined by what the apparatus can pick up, record, process, store and transmit based on its program.

But this is not to say that the technical image offers its viewers immediate access to the world as it is. For Flusser, nothing could be further from the truth. Instead, Flusser is at pains to tell us that the technical image *is an image*; it is a transformation of an event into a scene. This is important to remember because, as he argues, the magic of technical images is that they convince their audiences to project their programs onto the world, so that they begin to see the world through technically produced modes of seeing. We begin to see the world and events through an intense focus on the present, the smallest bits of information, which is supported by our belief in programs. Flusser, ([1983]2014) writes:

... there is something we can say about these images after all. For example, they are not windows but images, ie surfaces that translate everything into states of things; like all images, they have a magical effect; and they entice those receiving them to project this undecoded magic onto the world out there. The magical fascination of technical images can be observed all over the place: the way in which they put a magic spell on life, the way in which we experience, know, evaluate and act as a function of these images. It is therefore important to enquire into what sort of magic we are dealing with here. (p. 16)

Flusser explains that the magic that is involved is related to the technical term 'program', as a form of written instructions, which imposes itself on the world 'out there', in a different way to traditional images and written texts. The program gives its users a way of making images automatically: the camera works according to a program, the television receives and processes signal according to a program, the computer can edit together frames, can create new images that never before existed and can rearrange pixels according to a program. The users of this apparatus produce images on computer screens, they use cameras to record images and computers to manipulate them. They upload these images and are able to store them in an archive, making their memories external. Like Stiegler's work on the technical essence of humans and tertiary memory, Flusser shows how technological apparatuses act as externalisations of memory. In Flusser though, humans act in order that machines can function, becoming themselves parts of the machine, rather than the other way around. These users, rather than the creators of images, are instead seen by Flusser as feedback mechanisms for the apparatus itself and the mechanism for its expansion. As users play with computers, manipulating images, they work within the computer's program and incrementally improve its operability, improving what it can do, improving the program, as they continue to push it further into every aspect of

daily life. The important difference between the program of writing or the program of traditional images is that the program of technical images is there for the machine to follow, not the human. Writing and painting follow a set of standard protocols, whether this be grammar or the laws of perspective. The artist creates based on a relationship to these standards. In the case of technical images, the program instructs the apparatus how to produce images, not the human user, who instead has to learn the rules of the interface. As Wendy Chun (2013) puts it, because the programmed rules remain invisible to the user – those intricate pathways, frictions and fissions that control the production and circulation of images, that limit possibilities and veil other possible responses – the user is no longer ‘in the picture’. It is in this sense that, for Flusser, society becomes merely a function for the image-making apparatus, extending its capacities and driving the development of its program.

We can now make two claims about Flusser’s technical image: (1) the technical image is produced by an apparatus that operates automatically to separate events into segments that can then be reassembled to create an image; this process is based on a program; and (2) human users become functionaries of the technical image by projecting its way of calculating and evaluating events, so that there is no other possibility of understanding the world outside of its program. The result is an intense focus on the present and the measurable, rather than the unformed future. For Flusser, the only way for us to resist becoming functionaries of technical images and subjects of the temporality that they produce is to remain aware of their programs, and to visualise their codes and operations (Ieven, 2003).

Now of course, the existence of the technical image is not always apparently different from traditional images. The pixel, the point, the meaningless image-components, are not usually experienced in any direct way. They are usually hidden behind images, they disappear so that the image itself can appear, circumventing our perception. This is why it is often thought that the processing of images has no effect on us at all. After all, we see images at the end of the transmission chain, after they have been processed. But this is precisely why it is important to think about them. These once invisible things are now the foundation for digital culture and are constantly experienced vicariously through our interaction with technical images. They matter not in the same way that on-screen visual content matters. Instead, they matter precisely because they contribute to what *can be represented* and what we consider as ‘real’. As Friedrich Kittler first said, the real is now reduced to that which is switchable and that which is thus able to be read by the technical program of the electronic binary computer (Kittler, [1999]2010, p. 225).

The computer highlights the segmented nature of moving images, whereas in perception, the human senses only pick up and register the moving image, rather than the still frames or separate pixels. But these usually invisible things, although meaningless in the conventional sense, provide the conditions for the possibility of experience, the possibility of communication, the 'imperceptible background' (Hansen, 2015, p. 143), and, as will be argued in what follows, underpin the way time can be represented. In the following, the term *analytical media* is used to describe these machines.

The analytical measures what is thought to be self-evident; it scrutinises what is already there. The synthetic on the other hand produces novelty, it is contingent and moves forward into a field of chaos, creating something new, becoming, producing the unformed, causing things to appear. Analytical media take events as a pre-given occurrence, subtract time and analyse them as discrete instants, no longer moving towards an unformatted future. The computer is not the only analytical medium, but it is the one that provides the most easily identifiable metaphor for the analytical tendencies of digital culture, so much so that theorists have begun arguing that the algorithm actually provides the means with which to understand contemporary life (Beer, 2009; Neyland, 2015; Slavin, 2011; Totaro & Ninno, 2016). This is one aspect of programmable, analytical media, but the other, more worrying aspect, is the temporality that it introduces, where the future is never allowed to exist as a field of potential.

Time

Wolfgang Ernst, one of the key voices in media theoretical considerations of time, has, like Flusser, taken a technico-mathematical approach to reconceiving the time of the digital present. As Ernst (2015) argues:

In digital culture more than ever, the present is immediately quantized, 'sampled and held' (the electronic pre-condition for real-time digital-signal processing). The audio-visual and textual present is being archived as soon as it happens – from Twitter messages and instant photography to sound recording. But even more dramatically undoing the traditional order of times, big data analysis algorithmically predicts the future already as future-in-the-past (*futurum exactum*). Never has a culture been more dynamically 'archival' than the present epoch of digital media. (p. 22)

The archival, rather than the historical character of the contemporary moment is a product of technical media that is able to process signal based on the von Neumann architecture and store this data along with instructions (algorithms) for processing future signal. The archive not only holds onto the past, but the future perfect as well (what Ernst calls the *futurum exactum*), as a future that has not yet but inevitably will (statistically) take place. The

present begins to dilate into other spheres of time (past and future). It becomes the condition from which the future and the past are written.

Luciano Floridi, the important philosopher of information, offers a similar formulation in his description of what he terms 'hyperhistory'. According to Floridi, the historical subject lives in a world where information communication technologies (ICTs), since the development of the proto-writing systems around 8,000 BCE, are used to record and transmit data. In so-called 'hyperhistory' ICTs recorded, transmitted and *processed* data autonomously and, because of this, human societies became dependent on them as a vital resource (Floridi, 2015, pp. 51–2). What we find in this element of Floridi's thought, as well as that of both Flusser and Ernst, is the possibility for a media philosophy that offers a way to think about mediated time and temporality as it is related to information storage and processing. To conceptualise and critique the time of the digital, media theory needs to expand discussions beyond historical time and its relation to the 'cinematic time' that marked out modernity. Time, in this era of discourse, was represented by a succession of images, moving towards the ungiven and ungiveable whole. The image, as Deleuze told us, once created a rupture, a line of flight, a torrent towards a deindividuated becoming. But now things have changed; the conditions for the representation of time have shifted. A media philosophy of time now calls for a focus on the non-discursive function of media, which is radically different from an emphasis on the synthesis and push towards an unformatted future of discursive media. This offers a way to describe the new and complex temporalities produced by time-discrete signal processing, which are not so much without time, as Bergson (1950) once argued, as overfull with a type of time that is very different from human, historical time. As Flusser said, we need to remain aware of these programs and become conscious of the possibilities as well as the dangers that they might bring into being. These processes are the materially real. They are also the way that the real is projected onto the possible, in the sense that they are the operations that measure the present and then seek to define the future. They are the opposite of the process of actualisation, as Grosz describes it, as the creation of heterogenous terms (Grosz, 1998, p. 51). The movement of the multiplicity is limited by analytical media, which bases its representation of the objects of the world and its predictions for the future on the measurement of the present. The leap of creativity into the future that Grosz writes about is replaced by the concretisation of a program.

Digital media work on the digital principle of discrete signal processing. However, when we reflect on these processes from a media philosophical perspective, looking past purely human experiences of time to the way it is

measured by technical media, it might be considered that the time-discreteness of the digital has the potential to open vastly new, multiple and folded modes of temporality. First, I will look to the reduction of the instant as a discrete moment in time, the negation of an open, unformatted future, and then go into the new possibilities opened up for the representation of time by contemporary media artists and the thinking about media that might follow.

Time-discrete Media

The instant, the supposedly timeless, has been given formal importance in the engineering of media apparatuses themselves. The privileging of the time-discrete occurs most obviously in terms of digital-signal processing, where thanks mainly to the work conducted by the nineteenth-century mathematician Jean-Baptiste Joseph Fourier, samples are taken of a continuous wave function, held and reassembled: a process that is instrumental to the operation of digital-signal processing.

Fourier made the mathematical discovery that any variable could be represented as a series of multiples of the original variable. Periodic functions could be dissected into smaller parts, which may be either time-continuous or time-discrete, and then reconstructed. This was a discovery that was to become fundamental to information theory. This approach, however, of conducting analysis through the segmentation of a whole was an example of a larger cultural technique that was being undertaken in fields such as medicine, criminology, heredity and biometry, largely supported by the new statistical methods introduced by figures such as Francis Galton and Karl Pearson, which emphasised a data science that was focussed on the localised and the discrete, from which inferences could be made. The Fourier transform, as a mathematical operation and a way of computing the world, seems the example *par excellence* of this then new media theory of the world, which would later be represented in the 'particalised' media philosophy of Flusser, and the mathematical theory of information developed in the field of engineering by Claude Shannon.

The Fourier Method is important to scientists and media philosophers alike because it represents a moment when the contingent becomes calculable. It also provides the basis for the realisation of audio and visual recording technologies that, for the first time, began to record previously invisible and inaudible elements of reality, those things that oscillated either too fast or too slowly for human eyes or ears. The purely unrepeatable 'becomes visible as the sum of decimals, and thereby also becomes repeatable' (Krämer, 2006, p. 101). Different to language and the phonetic alphabet, the Fourier

transform was based on the calculability of the irregular, the organisation of the chaotic. This, as Mark Hansen (2015) has written, leads to a situation of computational ‘feed forward’, where micro-sensory functions can be picked up by the computer, bypassing human consciousness, and then processed in a way that influences future decisions.

The Fourier transform refers to an analytical process where a time-continuous wave form is deconstructed into the other time-continuous frequencies of which it is constituted. It is a process where a constant function of time can be separated into sinusoids, its modulating constitutive elements of sine and cosine functions. A numerical variation on the Fourier transform, the discrete Fourier transform, allows time-continuous signal to be processed and transformed to time-discrete samples. By this operation, not only can a waveform be represented as a sum of sinusoids, but it can be further broken into segments and represented as discrete samples. This has proven to be foundational to digital-signal processing and compression, where algorithms can be developed to filter out undetectable frequencies and hence reduce the number of bits needed to transmit a reliable signal. For the material world of vibrating signal, the Fourier Method achieves a numerical dissection. The Fourier Method now gives signal, from sound waves to photography to the analysis of complex change over time functions, a unique temporal character that underpins its capacity for representation. In terms of both the technical qualities of images and the images themselves, it is the instant, the sample, the point, the reliable and the computable that matter.

Measurement and Media

Ernst uses the examples of Édouard-Léon Scott de Martinville’s phonograph to illustrate the way mass media have roots in measurement and analysis, which owe a great deal to the discoveries made by Fourier (Ernst, 2013, p. 184). Ernst’s example is a good one to use to begin to see how the apparatus of measurement, once relatively benign and specialised, becomes tangled up in life and forms part of the elemental surroundings that we now call mass media. Scott’s phonograph (Figure 1.1), patented in 1857 and preceding Edison’s and Berliner’s inventions, was used to record sounds as a linear inscription on blackened paper. A membrane was set behind a bell mouth, which was used to amplify incoming sounds and direct them in such a way that set the membrane vibrating and caused a wire brush to trace the frequency of the vibrations, hundreds of them per second, onto a cylinder, giving material form to the mathematical theory proved around thirty-five years earlier by Fourier. Scott’s device was never intended as a playback medium but was instead

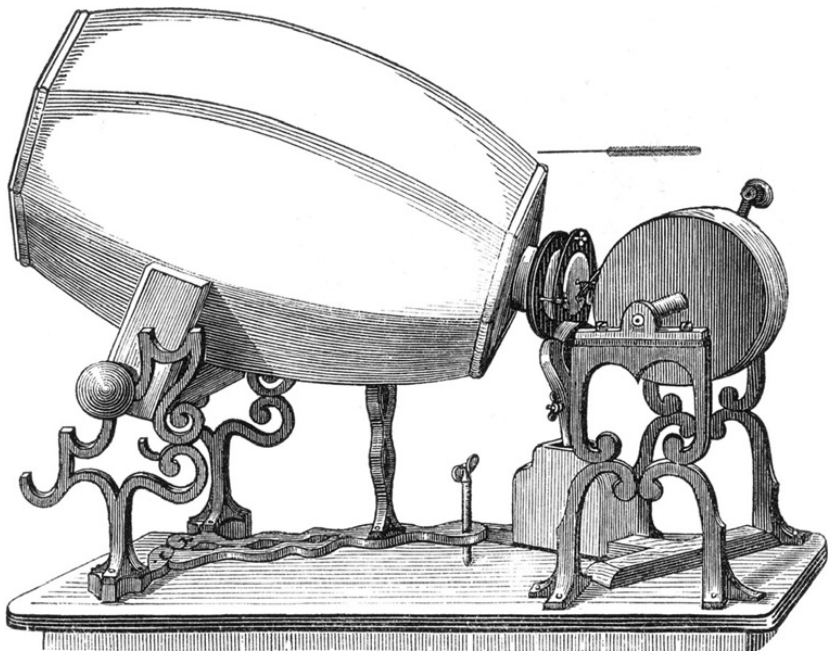


Figure 1.1 Image of Édouard-Léon Scott Mandeville's phonautograph

developed as a laboratory instrument to study acoustic waveforms that were both audible and inaudible to humans. It was not until later that it was discovered that the recorded inscription contained enough information about the sound to actually be used to play back the recorded sounds. Friedrich Kittler similarly points to the analytical function of the phonautograph and gramophone, which retrieve the original function of Scott's invention, where he argues that the analysis of speech – *an analysis of the material rather than the symbolic* – that was afforded by the invention of recorded voice machines was instrumental to the vast changes to discourse seen around the end of the nineteenth century. These machines were able to be used for analytical purposes by slowing down the playback speed to reproduce for human ears sounds previously unable to be notated. The gramophone and phonograph, when used as a talking machine, were able to allow slow-motion studies of single sounds that were previously unavailable. This made the devices ideal in laboratories for measuring hearing. In schools, these devices were instrumental in allowing the analysis of 'the most fleeting, unrepresentable and yet so important, characteristic aspect of language, of line phonetics (speech

melody) and of line rhythm' (Surkamp in Kittler, [1985]1990, p. 233). Real phenomena were now able to be stored and played back depending on technical standards, which importantly included the temporality that the medium inscribed on the phenomena. As mentioned earlier, the real began to be defined by what apparatuses could pick up, store and play-back, including noise. The real became the property of media, which was no longer solely responsible for the production of the symbolic.

Like the phonograph, the camera was also to be applied as an analytical medium. This is perhaps most obvious in the work of scientists Étienne-Jules Marey and Eadweard Muybridge, who both famously studied movement via the techniques associated with chronophotography. Before the introduction of the photographic to this technique, scientists such as Joseph Plateau and Simon von Stampfer demonstrated the experiment showing how a spinning disk could be used to mobilise still images into apparent continuous motion (Wade, 2016, p. 4). Drawing on earlier work concerning the persistence of vision, Plateau and von Stampfer were able to show how moving reality could be reduced to still images of incremental progression. Scientists such as Albert Londe, working at La Salpêtrière hospital under Jean-Martin Charcot, could then use this discovery to record the movements and disturbances of patients with varying neurological disorders and isolate frames in time that could be studied closely and precisely. As already mentioned, the real became that which could be ordered by the apparatus.

Out of Cinematic Time

Prior to the dominance of analytical media, throughout the twentieth century, it was the synthesis of mass entertainment media that conditioned the mediation of the real. Ever since cinematic images became widespread, and perhaps even before this moment, it has been claimed that civilisation, at least in the West, has begun to occupy 'cinematic time' (Doane, 2002; Stiegler, [2001]2011). By presenting apparent continuity through its framing of time as 'stopped' moments, cinematic apparatus participated in a larger project of modernity where the rhythms of the day were regularised and standardised (Doane, 2002). According to E. P. Thompson's formulation (1967), around the birth of the era commonly referred to as modernity, the workday for much of the population of cities in the West became institutionalised and workers began to base the rhythms of their work on mechanisms. Pre-industrial society waited. They waited for the harvest. They waited for the seasons to change. Industrial society moved things. Like synthetic media, they transformed the environment. One worker in line finished their task. The next

commenced theirs. As the product, whether a motor car, a children's toy, furniture or textiles, rolled along the factory line, it was assembled with a repeatable precision. This is a relatively simple example of a technique based on the chronology produced under capitalism, but it could be extrapolated into other contexts such as financial markets that represent time on stock tickers or historical time that represents single events within the narrative chronology of eras, with cause and effect predictably following on from one another in relatively 'shallow' time loops. Industrial time, historical time, is linear, it progresses towards the new. 'It comes from the past and demands the future. Nothing is, everything becomes' (Flusser [1983]2013, p. 119). As Zielinski points out, this is in complete accord with 'the dogged regularity with which the film carrying the photographs was moved on a fraction, sixteen or thirty-two times a second (according to shutter-type), stopped, illuminated, and then transported again' ([1989]1999, p. 79). Movement was towards a future, the medium was synthetic, the focus was on what was about to become, what was about to appear.

A set of cultural techniques was developed for ordering time that was supported by the technical hardware of the cinema, which presupposed a particular 'capturing' of contemporary life by the camera and its transformation and representation as an image always pushing towards the future, towards the next frame. The apparatus acted as a device, that, as Greg Lambert (2016) writes 'literally causes ("makes ready") something to begin to appear – sexuality, power, the state, God, etc.'. In this case it was time that the apparatus caused to begin to appear. Given aesthetic form in the cinema, the time that filtered through modernity was regularised, ordered, packaged and, importantly, able to be represented. The cinema not only participated in the organisation of modern time through its technical function but also, in its self-reflexivity, produced images and stories that reflected the temporalities of life under capitalism, modernity and media machines. This is an argument that is rehearsed in film theory from Deleuze's *Cinema 1* and *Cinema 2* books ([1983]2005 and [1985]2005) to the important work of Doane. But things have changed. The audio-visual apparatus, the disposition, a time-critical rather than ontological system, has changed and so has the time that it causes to begin to appear. As already mentioned, the present, rather than its becoming, is what is recorded and evaluated by analytical media. 'The present is the totality of the real. In it all virtualities are realised. They "present" themselves' (Flusser [1983]2013, p. 119). Even the past is now stored in the present. Even the future becomes coordinates of the present.

In its concrete actuality, the irreducible flow of time is in fact now made reducible to discrete instants, and hence made less productive. In terms of

the way that the dominate apparatus of our time, the digital computer, 'captures', 'downloads' and 'transforms' human subjects, it seems that it is time-discrete data and momentary discontinuities that are now to be privileged, rather than the acoustic, free-flowing environment that McLuhan once described. Perhaps Bergson was right. It is no longer the durational flow that defines contemporary time but rather a return to the function of analytical media that Kittler alerted us to, as time-discrete signal processing. Once the cinema defined its subjects (in images and stories), now the computer defines its users (as data), just as the phonograph and the chronophotograph defined their subjects. The operations of media such as the cinema, and the techniques that they reflect are, as they always have been, functions that give users a sense of the rhythms of the real. This observation is what led Bernhard Siegert (2015) to argue that it was the material-symbolic infrastructures supplied by techniques of signal processing that have constituted the becoming subject within the world. The mirror of cinema is replaced by the measurement of analytical media.

Siegert, by using Max Bense, argues that the world when defined by computers is determined as a signal processing which replaces beings with frequencies, attributes with functions and qualities with quantities. To arrive at a media theory of the world, objects, processes and attributes need to be redefined in media technical language, as the world is made understandable both by and for the computer (Heidenreich, 2015, p. 137). Lacan once offered film scholars a way of discussing in psycho-analytical terms the subject arrested before cinematic images, as though an infant before a mirror, defined by experiences given through the camera. To know that I am alive, to know what I am worth, I look to the reflections offered by the Other. They tell me what it is like to be alive. Is it now the cultural techniques associated with digital computation that fulfil this role? Does the computer reflect to me what it is to be alive, as data that can be processed?

In the tradition of humanist media studies, however, the computer is, like all other technology, often reduced to a tool. Because of this the humanities have been able to simply describe the tool based on its appearance to a human user, and not on its own characteristics, which condition the way it is used. 'Those who have tried to pour the fuzzy logic of their insights and intentions into computer source code know from bitter experience how drastically the formal language of these codes distort those insights and intentions' (Kittler, 2006, p. 49). Logic is poured into the computer, but it first needs to be transformed in order to be compatible with the formal language of the computer. Feedback loops lead from the machine to the human user, not the other way around.

Rather than the tool being defined from the point of view of the user, we need to start with the other term in the equation. How is the user defined by the computer? What operations are permissible in terms of the rules of the specific coding language?

Let's start to think about this by looking back once more to a key point in the development of computer systems for sorting data: Charles Bachman, one of the first people to realise an effective database management system for computers, stood before a computer at General Electric watching a file run through it. Based on the earlier sequential punch card system, the magnetic tape that he was using contained data in a sequence, with each piece of information attributed a unique number. Bachman requested some data be returned by the computer and it sorted through the sequence in chronological order until the correct number was found. Whether looking at social security numbers, purchase orders or bank account numbers this process was the same. But when Bachman was able to use a new direct access machine and develop a management system to use alongside it, things changed. He no longer stood before the computer as tape passed through it but used the computer to search through a database. The database – the storage system rather than the computer – was at the centre of the information-processing universe (Bachman, 1973, p. 654). Data no longer went through the computer in sequence but went into the database and was stored. An opportunity arose for him to dramatically change the face of information processing. He saw the potential for the machine to access information by probing for a record, rather than sequentially sorting through all the data (Bachman, 1973, pp. 654–5). This was not only a breakthrough in terms of information systems but would also have dramatic consequences for the way all kinds of events could be archived and organised and for the way a subject could come to terms with a world of data. The subject was no longer a stationary figure that watched as things passed before their eyes. The subject was now defined as an operator able to dive into *n*-dimensional data space.

Dimitris Eleftheriotis (2010) has written that 'a linear, incremental and forward movement of a progressing subjectivity travelling towards ever-increasing knowledge' became the all-pervasive metaphor for life in the eras of modernity (p. 12). In Lutz Niethammer's (1992) words, '[t]he twentieth century is distinguished by the fact that the abstract, linear understanding of time which marked the human sciences in the eighteenth century, as well as the historical conception of nature in the nineteenth, have entered into the everyday life of society' (p. 26). Or as McLuhan (1962) put it, after the Renaissance, a world of multiple durations was replaced by a new lineal world, as people were translated from a world of 'roles' into a world of 'jobs'. At this point, work becomes

specialised and the senses fragment. The ear, the eye; touch, taste, smell can be used to develop their own brand of knowledge, with the eye and linear reading being privileged. Both McLuhan and Flusser wrote that the eye moves along a line of print towards ever-increasing knowledge, like the film moves through a projector, towards the future, or like tape moves through the computer at General Electric. But now the contemporary subject knows this experience less and less and is instead presented with a condition that could perhaps only be described as the aftermath of the accumulation and measurement of the stories of modernity. Historical subjects put things in front of themselves. Digital subjects wait and occupy themselves with the stories that have been accumulated in store-houses of data. To put it another way, digital subjects put things in storage. This will be fleshed out with examples in the remainder of this chapter. For now though, we might say that in the face of ubiquitous computing, cinematic time – a time that does not stand still but instead flows – has been replaced by a time that is discrete and instantaneous. This is a time that ‘breaks the surface’ of cinematic time, that gets ‘exposed’ and separates itself from the time of succession (Virilio, [1997]2008, p. 27).

Media Art

How does art respond? Given the way analytical media privileges the discrete and separates time from succession, contemporary art has only one option if it hopes to articulate the experience of life in the present. It now turns to the instant. If art today is to be considered contemporary, to embody ways of being, its subject can only be the ontology of the present (Smith, 2009). But taking on this subject, contemporary art seeks to make the present dysfunctional; it seeks to make the present function in a radically different way from what is given to us in digital culture. This has always been the task of what we used to call the avant-garde: Futurism, Dada and formalism all took it upon themselves to make the present dysfunctional by re-ordering the time of the present through the destruction of the past, the undoing of values, the revolutionary value of the dissolution of images (Groys, 2016, pp. 50–2). Contemporary media art continues this tradition by upscaling the processes that define the present as an instant without time – the still, the pixel, the archive – and then reinserts time into these ‘post-historical’ moments, making them thick with temporalities. In grappling with the present as an instant, a number of media artworks look to the limits of the present, some produce media anachronisms and some expand prior media temporal systems and attempt to view the instant over much more drawn-out moments in time.

Notable artists in this tradition include Douglas Gordon, who radically extends the duration of films to draw attention to both the individual frames and the interstices between frames. The most famous example of this is his work *24 Hour Psycho* (1993). But he also uses this technique, perhaps to more traumatic ends, to re-work the found footage in *10ms-1* (1994), where he slows down footage used to document and study the effects of 'shell shock' on World War I survivors. The work measures trauma, and in a sense reproduces this trauma in that it produces a sense of waiting by further segmenting experience and blocking the progression of time so that it accumulates. We wait for something to happen. But we also know what will happen. We can predict what will happen in the next frame; it is folded into our experience of waiting in the present.

The notion of slowing the forward momentum of duration is also seen in Jeff Wall's photographic work. Images taken over a period of months, sometimes years, are carefully composed by Wall to create photographic montages, which seemingly present samples of time. Durations are not only slowed but stopped and rearranged, as though images in a database, with different times overlapping one another. His most well-known work *A Sudden Gust of Wind* (after Hokusai) (1993), made to resemble Katsushika Hokusai's woodblock print, *Yejiri Station, Province of Suruga* (ca. 1832), was assembled over one year by taking photographs of sets, props and actors, which were then combined into the instant of the photograph. The theatricality of the image, the wind that blows through the photograph, the relationships between the figures from different times, further exemplifies the way movement, in this case the movement of the production over twelve months, is frozen in a multi-temporal present, with the instant represented as a scene that acts like an archive stretching back over the twelve-month production of images and even further, to the original woodblock print.

Wall's more recent work *Listener* (2015) (Figure 1.2), similarly presents a stopped, multi-temporal scene. A shirtless man, whose twisting figure resembles the images of Christ once seen in mannerist paintings, kneels on the ground, victimised, but speaking. A man leans over him, listening. What has just happened? What is about to happen? What words have been said? What will be the response? The theatricality of the image presents us with an agonising extended present. All of the elements in the scene, the rocks, the surroundings, the art historical references, the potential for action, take on significance as the past and future are folded into this temporally thick moment. The photograph, like Gordon's found footage, further alerts us to the way this 'real moment in time' and our experience of the *tempos* of this reality, is technically produced as

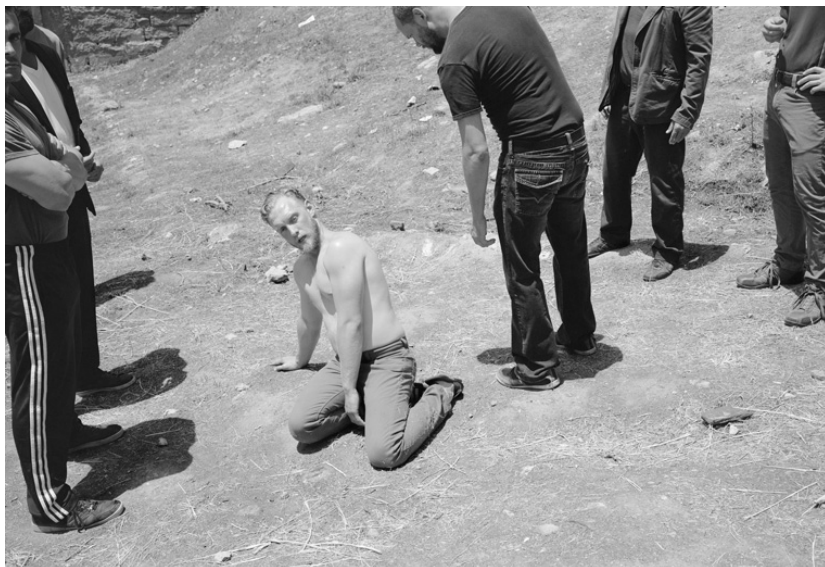


Figure 1.2 Jeff Wall, *Listener*, 2015, inkjet print, 159.4 x 233.0 cm.
© Jeff Wall, courtesy of the artist

a moment that nests within itself multiple temporalities and is at once up to date and already past.

Another figure in this tradition is David Claerbout, one of the most significant artists to give aesthetic form to contemporary philosophies of time. Whereas Wall's works embody the accumulation of time, Claerbout in works such as *Arena* (2007) and *Sections of a Happy Moment* (2007) radically extends the duration of an instant to break the surface of photographic temporality. Where Wall gives us the sense of a stopped moment in time, a break in succession, by folding multiple instants into one image, Claerbout unfolds one instant, one image, allowing it to unravel over time. In these works, the archive of moments such as the instant before a point is scored in a basketball game or significant but seemingly banal moments of happiness, made still in the photographs, are turned into images not of frozen sections of life but mediations that, via a reintroduced duration, extend into the future and become scenes. Claerbout achieves this by photographing the moment from multiple and unexpected perspectives and then introducing duration via montage. Standing before one of these installations the viewer sees the instant from multiple perspectives. It is no longer a frozen section of time but a scene that extends into the future and with each new image of the montage

offers us new information, new visions of the scene. In these works, the instant is examined and open to analysis in time. The extension of the instant, the usually fleeting moment, into the future, and the way in which this instant seems to be overfull with information, produce the *affect*, the feeling, of the work.

There is an inescapable sense in these works that, although viewers are offered multiple views of the same still section of movement, there is paradoxically never enough time to grasp the fullness of each instant entirely. There is paradoxically too much time to conceptualise all there is in the work. The temporary has become overfull with significance. These photographic images show, via their continual *re*-presentation of the instant, what it might mean to be with the temporary.

Perhaps the image that shows this best is Claerbout's recently completed video animation *KING (After Alfred Wertheimer's 1956 portrait of a young man named Elvis Presley)* (2015) (Figure 1.3). In 1956 Wertheimer photographed Elvis Presley at the age of twenty-one, just before he reached the heights of popular stardom and transformed into 'the King'. In Claerbout's reworking of Wertheimer's original photograph, the body of Presley, the body that will eventually become the King, is, in a computational type of recursive reflection, overlaid with textures of the King's body taken from a digital archive of famous photographs (Claerbout, 2015). The virtual camera in Claerbout's animation circles around the image; it produces the wandering gaze over the surface of the image and comes in for close-ups on the now 3D-animated version of Presley's body, made up from a composite of images only visible in close-up. The King is now able to be closely and methodically inspected at the moment of the original photograph, which is now overlaid by the media autopsy of this body, giving form to the thick multi-temporal event.

Claerbout shows us the ongoing remediation of a temporary instant, not so much in a way that demonstrates Barthes' well-known phrase 'this will be and this has been', but rather demonstrates the way analytical media continue to operate on archives of the past. The work demonstrates 'this once was and is now controlled by a program'. The image, not a record of what once was but now a conceptual abstraction, is based on the careful recomposition of a body based on the archive of photographic data of what that body would eventually become. Flusser once claimed that one's wandering gaze over the photographic surface creates temporal relations between the photographed objects. 'It can return to an image it has already seen and the "before" can become "after"' (Flusser, [1983] 2014, pp. 8–9). In Claerbout's work the computer takes over the role of the gaze and in a controlled way creates disjunctive temporal relations, not just between obviously visible elements of the photograph but



Figure 1.3 David Claerbout, *KING* (after Alfred Wertheimer's 1956 picture of a young man named Elvis Presley), 2015–2016, single channel video projection, HD animation, black & white, silent, 10 minutes, edition of 7 with 1 AP and 1 AC. © David Claerbout, courtesy of the artist and Sean Kelly, New York

between an archive of data in the form of textures of the King's body parts photographed throughout his career. In this image we do not look at a 'frozen image' but instead see a state of things translated into a *multi-temporal scene*. The technical image acts as a dam into which other images flow and become endlessly reproducible (Flusser, [1983]2014, p. 19).

An artist that looks to the longer scale of the instant, where the experience of being with the temporary and the fragmentary takes form, in a similar manner to Claerbout's found photographs, is Dominique Gonzalez-Foerster. In *TH. 2058* (2008), which was first exhibited as an element in the Unilever Series in the Turbine Hall at the Tate in 2008, Gonzalez-Foerster extends the contemporary moment fifty years into the future, when cultural artifacts, as she puts it, 'take shelter' in the Tate from the catastrophic climate change that has begun to take effect. This work presents the instant rather than the durational in the sense that no change takes place, only the sensation of being locked into an archive of artifacts at what might be considered the end point, or aftermath, of historical time. The Tate in 2058 acts as an archive for the books, films,

sculptures and other artifacts of culture and a place that now stands in for the collective memory of a civilisation at the moment of extinction of the extended but still temporary moment. This archiving also speaks to the nesting of time within the work, not only focussed on a type of speculative fiction of what London might look like in 2058, but also nesting within itself the incremental and catastrophic accumulation of present moments, of which we are all as contemporaries implicated, and also nesting within itself, via its archive of cultural artifacts and traces of collective memory, events that stretch back much farther than 2008. The work is analytical because it extends the instant and is intent on carefully analysing what makes up this instant, rather than following vectors or creating the sense of a time that flows through the present to a future. The work engages a media aesthetic because it demonstrates how analytical and archival techniques, using media to preserve the past, creates an environment of storage time. Much like the tradition of archive artworks such as Muntadas' *The File Room*, the series of works conducted by Walid Raad under the banner of The Atlas Group, and indeed Claerbout's *KING*, it presents its archaeology of the present via non-chronological means; it blocks the transmission of events towards a future. What we see is a close analysis of a moment, which has been brought into such a close-up view that it dilates throughout time, and the contemporary, the idea of attempting to grasp and archive a continually fleeting moment, becomes the condition that underpins the work. The temporary instant is extended in this work to the beginning of extinction itself. Where previously the instants of history came to an end, where paradigms would shift and be replaced by something new, now all that is left after the end of the instant, this stretched-out aftermath of history, is extinction itself.

Gordon's and Claerbout's work, which allow small instants to unravel over an extended time period, Wall's photograph, which theatrically assembles instants into a new scene and Gonzalez-Foerster's work, which offers viewers an opportunity to engage with the idea of a very large, non-chronological instant, give form to a condition of a present in the aftermath of time, a condition without a transition to a future, without an actualisation of the virtual, or what Siegfried Zielinski described so perfectly as *melancholia, a being too much with time*. Either in very small or very large instants, where chronology is replaced by the archaeology of the moment, in all the media artworks mentioned above, the present is thick with temporalities that percolate beneath images, where events no longer roll on but instead remain blocked up in scenes. In these artworks, the moment, the instant, is thick with time and it is in this way that these artworks provide a way to reconceptualise the world of analytical media. Where the analytical, as was shown by McLuhan and Flusser, separates time into thin, anaemic points,

focussing attention and experience on the present, these artworks, by amplifying the analytical, by making it work harder and that way making it dysfunctional, show how the contemporary moment might be a time in which the past and future get radically reconceptualised as within, rather than beyond, the present.

In this chapter I first offered a description of the technical image and its break from traditional image making. Using Flusser, I asked what happens when events and time are made into particles by the apparatuses that are culturally dominant. I then explored the technical image as an example of analytical media, which works by breaking a continuous signal into smaller parts that can be analysed. I then focussed on the history and epistemological effects of analytical media, including developments such as the Fourier transform and Bachman's discovery of data management systems. The argument here was that, following Flusser, users begin to project technical apparatuses onto the world and begin to know and evaluate the world based on their programs. From here, we were able to generalise that technical images exist as the outcome of an apparatus that works based on a program to separate continuous signal into discontinuous particles of information. I then looked at the way this process introduces a new type of temporality to our contemporary lives, as different to what we in the West think of as modernity and the time of succession and progress. This was argued particularly by exploring the differences between contemporary analytical media and modern synthetic media – media that gestures forward into an unformatted future, into the unformed and the potential. Analytical media now challenge this once dominant form and offer to us new ways to represent time, usually by reducing it to what can be measured. The chapter then ended with the question of time and aesthetics, outlining a number of examples where contemporary artists amplify this programmed function of analytical media, making it visible and by this, the process of making the usually invisible visible, making it dysfunctional. These artworks resist the regularity and precision of analytical media and instead represent the multi-temporal, the non-linear and the thick moments of time that are folded into each moment, offering new ways to represent and conceptualise the time of the contemporary.

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