Postdigital Aesthetics

Art, Computation and Design

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Thinking Postdigital Aesthetics: Art, Computation and Design

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When examining our historical situation, one is struck by the turn towards the computational in many aspects of life. There have been numerous claims to epochal shifts from the post-industrial society, the technotronic society and the knowledge-based society, to name just three. Equally, with the introduction of softwarized technical systems, it is sometimes claimed that we live in an information society (for a discussion see Berry 2008). While numerous definitions exist, we now appreciate that around us algorithms running on digital computers mediate our lives by creating and re-presenting a world that appears more comfortable, safer, faster and convenient – although this may paradoxically result in our feeling more stressed, depressed or drained of meaning.

Indeed, we are now seeing a dramatic change in the way in which sociality is performed and mediated through new distributed digital media technologies. Crucially, this change is also to be seen in the way in which sociality itself is understood, for example through social media and related technologies. That is, we see simultaneously an epistemological and pragmatic shift in everyday life towards the use of computational systems to support and mediate life itself. As the computational increasingly penetrates life in profound ways, it does so with a new intensity in terms of a complex repertoire of user-oriented logics drawing from an interdisciplinary archive of aesthetic, human–computer, psychological, sociological, phenomenological and design research. This research has been mobilized to provide a texture and a form to computation, which has built an infrastructure that performs a logic of impalpability, that is, an imperceptibility to the machinery of computation through a veneer on which the commodity form of computation is inscribed (Berry 2014, 69). Indeed, this also points to the importance of new critical disciplinary engagements with the computational reflected in, for example, digital humanities, software studies, digital sociology, computational social science, digital history, computational media and so on (see Berry 2011; Golumbia 2014; Wardrip-Fruin and Mateas 2014).

We might say that a new *constellātiō* informs an epistemology of the historical present, with an episteme informed by a new historical constellation derived from the truth-values implicit in the interdisciplinary formation of knowledges linked to computation, or at least a scientism that distils these knowledges into a performative form (see, for example, Lyotard 1984). Here we might reflect on the way in which new patterns are formed in and through the computational, with the logic of influence and logistics driving the instrumentality that is delegated to machines that materialize the spectrality of algorithms.

A new asterism

Following a line of reasoning that capitalism's ability to sublimate and defuse social conflict remains undiminished, there emerges a modulated intensity in terms of what we are here calling a new *asterism*. Constellations are patterns of concepts that form at a particular historical epoch. The concepts are usually not identical and not necessarily cognate; rather, they lie in the same historical epoch. This explains why the concepts can be contradictory or paradoxical and yet remain in a constellation as such. An asterism is a prominent pattern of concepts that lies within a wider constellation. By using the term 'asterism', we are gesturing towards new functions as a pattern of influence, or a new site of performative logic, which is not merely discursive but, crucially, material and operationalizable within the logic of software and code: that is, to focus on what we think is a key triptych in relation to the way in which asterisms are increasingly encoded, through art, computation and design. Thus, we can begin to unpack the way in which these formerly antagonistic knowledges become not only entangled and entangling, but also instrumental and operative. We could think of this as the emergence of a project of extend and embrace, whereby the formerly proto-scientific logics of computation envelop and transform art and design into computational media. In doing so, art becomes programmable, and design becomes a function of computation.

We are not suggesting that this is a totalization of all spheres of life. Indeed, there remain residual practices which will be outside, or on the margins of, computation, in some senses antagonistic to computation but also parasitic on the computational form. However, these will be peripheral practices in relation to the centre of experimentation and creativity within new forms under the terms of the asterism of computation, for example through increasingly computationally infused art and design practices. In a world of computational rationality and the new performative epistemologies it makes possible (Berry 2012), it thus becomes crucial to map and understand this new form of rationality in the light of instrumentalism and capitalism.

In this new constellation, the historical distinction between the digital and the non-digital becomes increasingly blurred, to the extent that

to talk about the digital presupposes a disjuncture in our experience that makes less and less sense in the experience of the everyday (Berry 2014; but also see Galloway 2014 for a discussion of non-digitality). Computation becomes experiential, spatial and materialized in its implementation, embedded within the environment and embodied, part of the texture of life itself but also upon and even within the body. Computation becomes something which operates while one walks around, is touched and touchable, manipulated and manipulable and interactive and operable through a number of entry-points, surfaces and veneers. Indeed, in a similar way to how the distinction between 'being online' and 'being offline' has become problematic, with widespread wireless networked devices, so too, perhaps, the term 'digital' describes a historical world of discrete moments of the computational. Through the increasing reality of a deeply embedded computational horizon, computational technology institutes new and ever more effective, more delightful and pleasant forms of experience instituting new diagrams of social control and intensified social cohesion. We will return to this issue.

In 2008, Anderson proclaimed the 'End of Theory', arguing that the data deluge made the scientific method obsolete. Indeed, he argues that 'we can stop looking for models. We can analyze the data without hypotheses about what it might show. We can throw the numbers into the biggest computing clusters the world has ever seen and let statistical algorithms find patterns where science cannot.' He argued that this is

> a world where massive amounts of data and applied mathematics replace every other tool that might be brought to bear. Out with every theory of human behavior, from linguistics to sociology. Forget taxonomy, ontology, and psychology. Who knows why people do what they do? The point is they do it, and we can track and measure it with unprecedented fidelity.
>
> (Anderson 2008)

Indeed, Anderson proclaims, 'with enough data, the numbers speak for themselves' (Anderson 2008). These claims are also advanced towards history, which is heralded as being equally amenable to computational approaches. We could go so far as to suggest that computation demands that people, practices, places, institutions and the world should radiate data (see Berry 2012). Indeed, this points to the notion that transparency should be a normative ideal, to which we might contrast the political idea of opacity outlined by Glissant (1997, 194), who argued for the 'right to opacity for everyone'. Computation intensifies as it mediates, creating a richer context and sharper perception by sensors, trackers, bugs and beacons that do not just collect and store a happening, but actively and comprehensively inscribe and store everything that can be grammatized in real time. If the

American composer Kim Cascone (2000, 12) argued over a decade ago that 'tendrils of digital technology have in some way touched everyone' then this encounter has surely intensified into a logic of capture. For example, at the level of the city, increasingly, governments and corporations desire to see the swirl of the city in a landscape of data which can be visualized and mediated through the abstract machines of data visualization and digital dashboards. A new society of control, intensified through computational media and their dissemination across social life while subject to real-time monitoring via surfaces and interfaces, is made possible with the advent of newly expanded sites for the computational (see Deleuze 1992).

Today we might say that the condition of possibility for this new milieu of contemporary life is 'compute': compute as the abstract unit of computation, as both *dunamis* (potentiality) and *energeia* (actuality), that is, as the condition of possibility for the question of the *in-itself* and the *for-itself*. Compute, as a concept, exists in two senses: as the potential contained in a computational system, or infrastructure, and in the actuation of that potential in material work, such that the theoretical question posed by compute is directly relevant to the study of software, algorithms and code, and therefore the contemporary condition in what we might call a computal society. Here we are thinking about the computal as a concept for thinking about the differing constellation of computational(s) (see Moores, Couldry and Berry 2015): that is, to 'stop thinking about the digital as something static and object-like and instead consider its "trajectories" ' (Berry 2014, 14). Compute, then, is a notion of abstract computation, but it is also the condition of possibility for and the potential actuation of that reserve power of computation applied to a particular task. Compute becomes a key part of a computational noetic and a means of thinking through the distribution of computation. It also highlights the importance of thinking through the technological imaginary of computal society, how concepts like the postdigital offer a means of contesting and critiquing the derangement and reassembly of knowledges through computation, and how other 'stacks' are still possible (see Berry 2014; Bratton 2014; Terranova 2014).

Post-internet, postdigital, New Aesthetic

The everyday experience of life within computal societies inspires a search for new concepts and experiences, or perhaps 'formal indicators' as vague neologisms, in an attempt to historically delimit and define the present. Accordingly, in different ways, notions such as post-internet, postdigital and the new aesthetic can be taken as attempts to grapple with the immersive and disorientating experiences of computational infrastructures as they scale up and intensify.[1] Indeed, the revival of Félix Guattari's concept of post-media can additionally be understood within this context of a search for orienting alternatives to counter the current trajectories of digitalization

(Apprich et al. 2013; Quaranta 2013). It would be inaccurate, or at least too easy, to quickly dismiss these terms as simply offline Romanticism, art world jargon or stylized cases of hipster analogue culture. On the contrary, we argue that they can be read as connected instances of an effort to collectively develop concepts that reflect on the *non-neotic* aspect of the digital. That is, as ubiquitous computational infrastructures radiate data, they encourage tacit modes of knowing and the iteration of habit – and thus also create *agnōsis*, or 'not knowing', through a form of agnotology. By 'agnotology' we are referring to the way in which computation facilitates a systemic production and maintenance of ignorance. Computational technologies direct us towards a passive trust in widely delegated, yet obfuscated, actions (see Berry 2012). This tendency towards automated and accelerated modes of action complicates and may undermine structures of reflection and critique. One consequence is a twisting and turning of computational logics into other contexts against attempts to orient and 'get a grip' on computational things. In this way, notions such as the postdigital are also performed and mediatized in rather novel ways, and can be taken as a complementary unfolding of an aesthetization of computational infrastructures.

This can be seen in the emergence of the *New Aesthetic* as a project initiated by James Bridle, a British designer and programmer, as an attempt to document and catalogue patterns of the computational throughout everyday life. The *New Aesthetic*, therefore, signals a kind of threshold or saturation point whereby the obscure ubiquity of digital, networked and mobile devices inspires a struggle to map, document and record; in other words, to make sensible and intelligible the seemingly opaque operations of digital infrastructure, even while invoking an ambiguous gesture of aesthetization using the Tumblr.com platform. Working from within an explicitly art-world context, the notion of post-internet art has, meanwhile, been elaborated as works that engage with digital networking through hybrid, often offline, manifestations. In this sense, artist and curator Marisa Olson uses the term to describe art literally created after internet use: the creative 'yield' from hours of consumptive downloading and browsing (Debatty 2008). This can, moreover, be taken as a situation of art making after the internet has massified through platformization, resulting in a mainstreaming marked by the shift from exceptional to ordinary perceptions of digital creativity. The role of the practitioner here, then, is also imagined in terms of techniques of recognizing patterns, cataloguing, curating, interpreting and transcribing (Vierkant 2010), and then actualizing these engagements as artefacts for potential contemplation. The 'postdigital', meanwhile, also covers a wide range of issues attached to the entanglements of media life after the digital, including a shift from an earlier moment driven by an almost obsessive fascination and enthusiasm with new media to a broader set of affectations that now includes unease, fatigue, boredom and disillusionment. Linked to ideas like the 'off-internet' and 'neo-analogue', the postdigital recognizes the revival

of 'old' media formats like cassette tapes or analogue synthesizers, and more generally maps out 'the messy state of media, arts and design after their digitization' (Cramer 2015, this volume). Crucially, this also involves working through the implementations of the computal in a regular state of constant upheaval. In other words, this is a condition in which digital disruption is not transcended as such, but becomes routine or business as usual.

All of these proposed terms and concepts seize on a hybridized approach towards the digital and non-digital, finding characteristics of one within the other, deliberately mixing up processes of making things discrete, calculable, indexed and automated in unorthodox ways. In doing so, they form part of an epistemological asterism of practices, experiences and mediations that follows the primacy of the computal as normative. That is, the appearance of these terms can be interpreted collectively as endeavours to elucidate the trajectories of ubiquitous digitalization; they collectively form new patterns which can help us begin to map and historicize the varieties of computal societies.

Summary of chapters

In order to explore further what we suggest is a new and somewhat perplexing set of developments – namely, the postdigital turn – we now introduce the work of the contributors in this volume. We asked the contributors to reflect on the multiplicity of the computational, particularly by thinking about the nexus between machinery and surface, namely the interface. The interface, here, is not necessarily seen as a digital object of study, although some contributions do explore this; rather, the interface is seen as both an aesthetic and a locale of design thinking: that is, also as a site in which a symptomology can be deployed to raise questions about our contemporary situation and to explore ways in which concepts and ideas, theories and statements, aesthetics and patterns are circulating around the computal as such.

This is not to imply that the aim was to outline a hermeneutic of the interface; rather, the intention was to explore contemporary manifestations and 'eruptions' of the digital into theory, art, design and everyday life more generally. From notions of the postdigital to the new aesthetic, there have been a number of attempts to situate and conceptualize the computational in relation to concerns about the affordances of digital technologies, media and infrastructures. Many of the contributions to this volume have attempted to reconstruct these computal constellations through a number of mediations, including objects, institutions, ideologies and theories, but there is also an explicit attempt to engage with the question of the computational as a fundamental problematic.

Florian Cramer opens this collection, asking: 'What is the post-digital?', examining a condition in which digital technology is no longer new media. He argues that 'post-digital' is arguably more than just a 'sloppy

descriptor for a contemporary, and possibly nostalgic, cultural trend'. Rather, 'post' should be understood in terms of post-punk, post-feminism, post-communism, as subtle cultural shifts and ongoing mutations. Thus, 'post-digital' refers to a state in which the disruption brought about by digital information technology has already occurred and, as such, represents a crisis of the cybernetic notion of 'system' which neither 'digital' nor 'post-digital' – two terms ultimately rooted in systems theory – is able to leave behind, nor even adequately describe.[2] In their contribution to the collection, Christiane Paul and Malcolm Levy trace a complex genealogy of the *New Aesthetic* that interweaves visual, theoretical and philosophical lineages. Discussing a wide range of phenomena movements from cybernetics to net art, they find a complex range of influences embedded in the 'blurry' collective impression of the *New Aesthetic* images, but nevertheless acknowledge that this strange low resolution of the assemblage is a central aspect of its appeal.

David M. Berry underscores this genealogical approach by situating the postdigital within an emergent historical constellation, and argues that there is a growing prevalence of a pattern-seeking mode of being, such that digital pareidolia points to the ubiquity of the postdigital as the horizon of experience and explanation. In a similar vein, Lukacs Mirocha explores the explicitly temporal dimension of the postdigital by focusing on the real-time dimension of computation through a close reading of the digitality represented and mediated through the project of the *New Aesthetic*. He argues that, although dismissed and considered less useful for academic exploration of the increasing computational content of our societies, in contrast, its very superficiality and emphasis of the surface is highly relevant for thinking about computation in today's world.

Katja Kwastek also argues that that dismissing the new aesthetic as superficial is inappropriate. She argues that the notion of a new aesthetic only makes sense if we take its focus on aesthetics seriously. Instead of mainly discussing what is represented, she suggests that an aesthetic approach asks how something is represented and perceived, and the question of the perception of the digital: that is, informed by the increasing ubiquity of digital technologies, which affects both our material culture and our perceptive formation. In his contribution, Daniel Pinkas reflects on the discourse surrounding the new aesthetic in terms of the inconsistencies of its truth claims, especially in relation to the distributed agencies of human and machine, and the prospects of artificial intelligence. While remaining critical of its tendency towards hyperbole, Pinkas nevertheless recognizes the potential of the new aesthetic as an imaginative design concept that can inspire novel creative work and art.

Indeed, Stamatia Portanova further reflects on contemporary visual culture industry and what she calls the corresponding obsessive digitality. She argues that there is a multiplication and dissemination of all kinds of images around the world, and, with its simultaneous decomposition of their texture

into a myriad of pixelated fragments and forms, the digital chunking produces a loop. This, she explains, is an invitation to rethink the digitality of the perceptual styles of our time: in other words, the pixelated images, grids and maps of the postdigital. Lev Manovich and Alise Tifentale offer a case study extremely relevant to the notion of the postdigital with a focus on the 'selfie', a particular practice and aesthetic they associate with mobility and the rise in digital networks and technologies. As such, they present 'Selfiecity', a big data project that collected large numbers of selfies to explore the shifting status of photography and how image-making and image-sharing technologies demand radically new ways of interpretation and analysis in what we might think of as a postdigital age.

In contrast, it is the very condition of big data and computational analysis that David Golumbia explores in his chapter. Here, he explores the way in which aspects of judging are delegated into the machinery of computation through case studies of high-frequency trading and computational analysis of law. Offering a 'critique of machine judgment', Golumbia argues that, rather than surrender judgement to machines, we must take very seriously the idea that human judgement is actually the only responsible form for human power to take. Caroline Bassett examines the postdigital through the lens of an appropriate response to the postdigital in feminist terms. She offers her own response to the contemporary condition as a renewed technophile feminism, but not one that 'pre-empts the object obsession of OOO [object-oriented ontology], for example by operating in quasi-mystical terms', but, rather, one that deals in new materials and seeks genuinely new subjectivities.

Geoff Cox offers a postscript on the postdigital by making the connection between the popularization of the term 'postdigital' and a wider cynicism towards the possibility of social transformation. Through an examination of the questions raised by the materiality of temporality, particularly through the work of Wolfgang Ernst, Cox reiterates the importance of the notion that change can happen. Michael Dieter examines techniques of contemporary corporate interface design in terms of patterns, trapping and captivation. He examines how the promise for insights that initially led the project to augmenting the intellect has devolved into the use of dark patterns as zones of non-knowledge provoked by a competition for attention and profit.

Similarly, Sean Cubitt explores how data visualization is now both big business and a ubiquitous feature of digital arts, and through this a new formalist mimesis is re-entering art practice. For Cubitt, data visualization presents itself as a meta-representation 'of the world in numerical form', one of the effects of which is that 'data visualisation pre-empts the role of the critic by providing an account of itself as an integral part of the presentation'. In other words, critique is always incorporated into new functions and mechanisms of computation and therefore 'integrated into new designs'. Ending on a dark note, Cubitt argues that the danger is that, from

the new 'givenness of data', data visualization projects an optimism instead of a reflection on historical catastrophe, undermining historical and reflexive consciousness and producing only a future for corporate cyborgs.

In her contribution, Mercedes Bunz analyses trends towards 'flat design' in web development as producing infantilizing effects in contemporary interface development. Tracing the emergence of this phenomenon through the influence of philosopher Jean Piagert on the work of computer scientists like Alan Kay or Seymour Papert, Bunz critically discusses the consequences of such playful approaches to computing from a postdigital perspective as a fine line between making learning tools for 'children of all ages' and 'engendering stupidity' as the ultimate desirable condition for the user. Providing a media analysis of the urban milieu of London circa 2012 that informs the 'scenius' of the new aesthetic, Jussi Parikka discusses forces of securitization, technical infrastructure and branding that characterized the city during a period including preplanned spectacles like the Olympics, the Queen's Diamond Jubilee and the Royal Wedding, alongside widespread riots and post-crash economic strife. With reference to the work of China Miéville and Jacques Rancière, his contribution explores the conflicts and tensions of 21st-century London, encompassing the seen and unseen, and the entanglement of commons with 'the world of uncommons, the City and the other city; a division that starts on the level of perception, articulating the proximity of aesthetics, politics and space'.

Shintaro Miyazaki argues against the visual register of discourse surrounding the new aesthetic, and places an emphasis on the significance of auditory and tactile senses through a media-archaeological perspective on signal processing. In doing so, he introduces a theoretical framework that draws from and transforms terminology in Gilbert Simondon's philosophy of communication. Thomas Apperley discusses the phenomenon of glitch tracking in the videogame *Minecraft*, the practice of co-creative production or 'playbor' through which players and developers have systematically incorporated, modified and deleted mistakes and errors from the game as an act of collective curation. Drawing from theorizations of the postdigital as an aesthetics of failure, while noting the existing divisions between game development, curation and artistic practice, Apperley nevertheless suggests that *Minecraft* presents a unique case for all these fields, especially as tensions in the collective 'sorting' of glitches are mediated and reconciled through play.

Marc Tuters explores a number of influential histories that have informed the development, design and marketing of a product like Google Glass. Taking the slogan 'Glass could change your life' at face value, he explores how this wearable corporate gadget mobilizes a particular Californian 'gnostic' mode of biopolitical production through its neoliberal mandate for self-governance, and questions how technological design and innovation might be practised otherwise. Vito Campanelli investigates the discourse surrounding the new aesthetic in terms of the so-called genre of 'net photography',

focusing in particular on recent work from artists Marco Cadioli and Jon Rafman. In doing so, he discusses a new sublimity of human and machine collaboration enabled by digital technologies that introduces sensations of being overwhelmed and displaced by abstract journeys through devastated mediatized landscapes.

Christian Ulrik Andersen and Søren Bro Pold, meanwhile, explore possibilities of 'new aesthetics as critique' after the revolutionary period of digital, networked and mobile technologies has come to an end. Suggesting that the seemingly arbitrary character of highly corporatized information aesthetics leaves a space devoid of meaning, but open for new visions, Pold and Andersen discuss artworks by Johannes P. Osterhoff, Christophe Bruno and Aram Bartholl in their search for 'fractures' within the otherwise kitsch and banal style of contemporary ubicom interfaces. In the final contribution, Wendy Hui Kyong Chun explores how the 'network' has become a defining concept of our epoch. She claims that the network has created new vectors such that networks represent everything that is 'new and different about our social institutions, global formations, and political and military organizations'. She links the network to the management and imaginary of neoliberalism, and argues that, instead, we need to think about networks differently by thinking them through the notions of habitual repetition and leaks.

Notes

1. In this book we follow the convention that 'New Aesthetic' or *New Aesthetic* refers to the project initiated by James Bridle. In contrast, 'new aesthetic' (lower case) refers to the general phenomenon, design or aesthetics associated with glitched computational technology, particularly low fidelity, pixelization, 8-bit graphics and so forth.
2. We have included the different usages of 'post-digital' and 'postdigital' to enable contributors to explore the tensions implicit in the differing formulations of the concepts.

Bibliography

Anderson, C. (2008) The End of Theory: The Data Deluge Makes the Scientific Method Obsolete, *Wired*. http://www.wired.com/science/discoveries/magazine/16-07/pb_theory, date accessed 18 January 2014.

Apprich, C., Slater, J. B., Iles, A. and Schultz, O. L., eds. (2013) *Provocative Alloys: A Post-Media Anthology*. London/Lüneburg: Mute and Post-Media Lab.

Berry, D. M. (2008) *Copy, Rip, Burn: The Politics of Copyleft and Open Source*. London: Pluto Press.

Berry, D. M. (2011) *Understanding Digital Humanities*. Basingstoke: Palgrave Macmillan.

Berry, D. M. (2012) The Social Epistemologies of Software, *Social Epistemology* 26: 379–398.

Berry, D. M. (2014) *Critical Theory and the Digital*. New York: Bloomsbury.

Bratton, B. (2014) The Black Stack, *e-flux*. http://www.e-flux.com/journal/the-black-stack/, date accessed 23 January 2014.

Cascone, K. (2000) The Aesthetics of Failure: 'Post-Digital' Tendencies in Contemporary Computer Music, *Leonardo* 24(4): 12–18.

Debatty, R. (2008) Interview with Marisa Olson, *We Make Money Not Art*. http://we-make-money-not-art.com/archives/2008/03/how-does-one-become-marisa.php#.VEktKYcUolJ, date accessed 23 October 2014.

Deleuze, G. (1992) Postscript on the Societies of Control, *October* 59: 3–7.

Galloway, A. (2014) *Laruelle: Against the Digital*. Minneapolis: University of Minnesota Press.

Glissant, E. (1997) *The Poetics of Relation*. Michigan: The University of Michigan Press.

Golumbia, D. (2014) Death of a Discipline, *Differences: A Journal of Feminist Cultural Studies* 25(1): 156–176.

Lyotard, J. F. (1984) *The Postmodern Condition: A Report on Knowledge*. Manchester: Manchester University Press.

Moores, S., Couldry, N. and Berry, D. M. (2015) Second Dialogue, in Markham, T. and Rogers, S. (eds.) *Conditions of Mediation*. Minneapolis: University of Minnesota Press.

Quaranta, D. (2013) *Beyond New Media Art*. Brescia: Link Editions.

Terranova, T. (2014) Red Stack Attack! Algorithms, Capital and the Automation of the Common, *EuroNomade*. http://www.euronomade.info/?p=2268, date accessed 20 February 2014.

Vierkant, A. (2010) The Image Object Post-Internet. http://jstchillin.org/artie/pdf/The_Image_Object_Post-Internet_a4.pdf, date accessed 23 October 2014.

Wardrip-Fruin, N. and Mateas, M. (2014) Envisioning the Future of Computational Media: The Final Report of the Media Systems Project. https://mediasystems.soe.ucsc.edu/sites/default/files/Media%20Systems-Full%20Report.pdf, date accessed 16 October 2014.

2
What Is 'Post-digital'?

Florian Cramer

In January 2013, a picture of a young man typing on a mechanical typewriter while sitting on a park bench went 'viral' on the popular website Reddit. The image was presented in the typical style of an 'image macro' or 'imageboard meme' (Klok 2010, 16–19), with a sarcastic caption in bold white Impact typeface that read: 'You're not a real hipster – until you take your typewriter to the park.'

The meme, which was still making news at the time of writing this paper in late 2013 (Hermelin 2013), nicely illustrates the rift between 'digital' and 'post-digital' cultures. Imageboard memes are arguably the best example of a contemporary popular mass culture which emerged and developed entirely on the internet. Unlike earlier popular forms of visual culture such as comic strips, they are anonymous creations – and, as such, even gave birth to the now-famous Anonymous movement, as described by Klok (2010, 16–19). Other important characteristics of imageboard memes are: creation by users, disregard of intellectual property, viral dissemination among users, and potentially infinite repurposing and variation (through collage or by changing the text). As low-resolution images with small file sizes, they can be created and disseminated almost instantly, in contrast with the much slower creation, editing and distribution processes characteristic of traditional publishing media.

The 'digital' imageboard meme portrays the 'analogue' typewriter hipster as its own polar opposite – in a strictly technical sense, however, even a mechanical typewriter is a digital writing system, as I will explain later in this chapter. Also, the typewriter's keyboard makes it a direct precursor of today's personal computer systems, which were used for typing the text of the imageboard meme in question. Yet, in a colloquial sense, the typewriter is definitely an 'analogue' machine, as it does not contain any computational electronics.

In 2013, using a mechanical typewriter rather than a mobile computing device is, as the imageboard meme suggests, no longer a sign of being old-fashioned. It is, instead, a deliberate choice of renouncing electronic

technology, thereby calling into question the common assumption that computers, as meta-machines, represent obvious technological progress and therefore constitute a logical upgrade from any older media technology – much in the same way as using a bike today calls into question the assumption, common in many Western countries since World War II, that the automobile is by definition a rationally superior means of transportation, regardless of the purpose or context.

Typewriters are not the only medium which has recently been resurrected as literally a post-digital device: other examples include vinyl records, and more recently also audio cassettes, as well as analogue photography and artists' printmaking. And if one examines the work of contemporary young artists and designers, including art school students, it is obvious that these 'old' media are vastly more popular than, say, making imageboard memes.[1]

Post-digital: A term that sucks but is useful

Disenchantment with 'digital'

I was first introduced to the term 'post-digital' in 2007 by my then-student Marc Chia – now Tara Transitory, also performing under the moniker *One Man Nation*. My first reflex was to dismiss the whole concept as irrelevant in an age of cultural, social and economic upheavals driven to a large extent by computational digital technology. Today, in the age of ubiquitous mobile devices, drone wars and the gargantuan data operations of the US National Security Agency (NSA), Google and other global players, the term may seem even more questionable than it did in 2007: as either a sign of ignorance of our contemporary reality, or else of some deliberate Thoreauvian–Luddite withdrawal from this reality (see also Berry 2015, this volume).

More pragmatically, the term 'post-digital' can be used to describe either a contemporary disenchantment with digital information systems and media gadgets, or a period in which our fascination with these systems and gadgets has become historical – just as the dot-com age ultimately became historical in the 2013 novels of Thomas Pynchon and Dave Eggers. After Edward Snowden's disclosures of the NSA's all-pervasive digital surveillance systems, this disenchantment has quickly grown from a niche 'hipster' phenomenon to a mainstream position – one which is likely to have a serious impact on all cultural and business practices based on networked electronic devices and internet services.

Revival of 'old' media

While a Thoreauvian–Luddite digital withdrawal may seem a tempting option for many, it is fundamentally a naïve position, particularly in an age when even the availability of natural resources depends on global computational logistics, and intelligence agencies such as the NSA intercept paper mail as well as digital communications. In the context of the arts, such

a withdrawal seems little more than a rerun of the 19th-century Arts and Crafts movement, with its programme of handmade production as a means of resistance to encroaching industrialization. Such (romanticist) attitudes undeniably play an important role in today's renaissance of artists' print-making, handmade film labs, limited vinyl editions, the rebirth of the audio cassette, mechanical typewriters, analogue cameras and analogue synthesizers. An empirical study conducted by our research centre Creating 010 in Rotterdam among Bachelor students from most of the art schools in the Netherlands indicated that contemporary young artists and designers clearly prefer working with non-electronic media: given the choice, some 70% of them 'would rather design a poster than a website' (Van Meer 2012–2013, 14). In the Netherlands at least, education programmes for digital communication design have almost completely shifted from art academies to engineering schools, while digital media are often dismissed as commercial and mainstream by art students (Van Meer 2012–2013, 5). Should we in turn dismiss their position as romanticist and neo-Luddite?

Post-what?

Post-digital = postcolonial; post-digital ≠ post-histoire

On closer inspection, however, the dichotomy between digital big data and neo-analogue do-it-yourself (DIY) is really not so clear-cut. Accordingly, 'post-digital' is arguably more than just a sloppy descriptor for a contemporary (and possibly nostalgic) cultural trend. It is an objective fact that the age in which we now live is *not* a post-digital age, either in terms of technological developments – with no end in sight to the trend towards further digitization and computerization – or from a historico-philosophical perspective. Regarding the latter (Cox 2015, this volume) offers a valid critique of the 'periodizing logic' embedded in the term 'post-digital', which places it in the dubious company of other historico-philosophical 'post'-isms, from postmodernism to post-histoire.

However, 'post-digital' can be defined more pragmatically and meaningfully within popular cultural and colloquial frames of reference. This applies to the prefix 'post' as well as the notion of 'digital'. The prefix 'post' should not be understood here in the same sense as postmodernism and post-histoire, but, rather, in the sense of post-punk (a continuation of punk culture in ways which are somehow still punk, yet also beyond punk); post-communism (as the ongoing social–political reality in former Eastern Bloc countries); post-feminism (as a critically revised continuation of feminism, with blurry boundaries with 'traditional', unprefixed feminism); postcolonialism (see next paragraph); and, to a lesser extent, post-apocalyptic (a world in which the apocalypse is not over, but has progressed from a discrete breaking point to an ongoing condition – in Heideggerian terms, from *Ereignis* to *Being* – and with a contemporary popular iconography pioneered by the *Mad Max* films in the 1980s) (Figure 2.1).

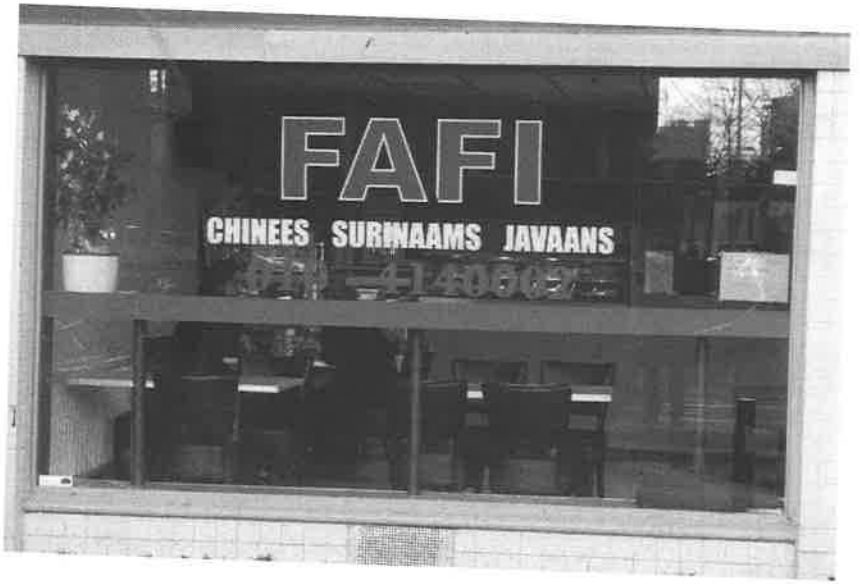

Figure 2.1 Popular take-away restaurant in Rotterdam, echoing an episode from 19th-century Dutch colonial history, when members of the Chinese minority living in Java (Indonesia, then a Dutch colony) were brought as contract workers to a government-run plantation in Suriname, another Dutch colony (Image by Florian Cramer)

None of these terms – post-punk, post-communism, post-feminism, postcolonialism, post-apocalyptic – can be understood in a purely Hegelian sense of an inevitable linear progression of cultural and intellectual history. Rather, they describe more subtle cultural shifts and ongoing mutations. Postcolonialism does not in any way mean an end of colonialism (akin to Hegel's and Fukuyama's 'end of history'), but, rather, its mutation into new power structures, less obvious but no less pervasive, which have a profound and lasting impact on languages and cultures, and, most significantly, continue to govern geopolitics and global production chains. In this sense, the post-digital condition is a post-apocalyptic one: the state of affairs after the initial upheaval caused by the computerization and global digital networking of communication, technical infrastructures, markets and geopolitics.

'Digital' = sterile high tech?

Also, the 'digital' in 'post-digital' should not be understood in any technical–scientific or media-theoretical sense, but, rather, in the way the term is broadly used in popular culture – the kind of connotation best illustrated by a recent Google Image Search result for the word 'digital' (Figure 2.2).

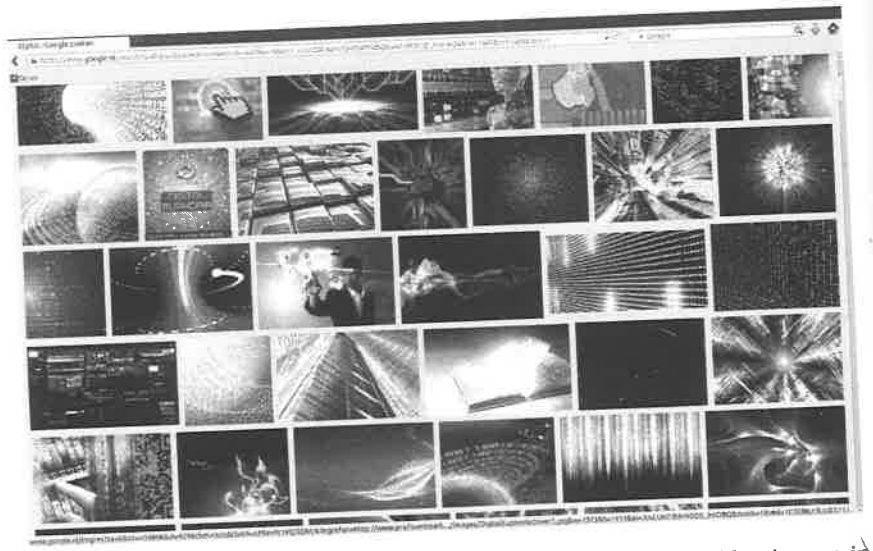

Figure 2.2 Google.nl image search result for 'digital' gives mainly blue images in original, October 2013

The first thing we notice is how the term 'digital' is, still in 2013, visually associated with the colour blue. Blue is literally the coolest colour in the colour spectrum (with a temperature of 15,000–27,000 Kelvin), with further suggestions of cultural coolness and cleanness. The simplest definition of 'post-digital' describes a media aesthetics which opposes such digital high-tech and high-fidelity cleanness. The term was coined in 2000 by the musician Kim Cascone, in the context of glitch aesthetics in contemporary electronic music (Cascone 2000, 12). Also in 2000, the Australian sound and media artist Ian Andrews used the term more broadly as part of a concept of 'post-digital aesthetics', which rejected the 'idea of digital progress' as well as 'a teleological movement toward "perfect" representation' (Andrews 2000).

Cascone and Andrews considered the notion of 'post-digital' primarily as an antidote to techno-Hegelianism. The underlying context for both their papers was a culture of audio-visual production in which 'digital' had long been synonymous with 'progress': the launch of the Fairlight CMI audio sampler in 1979, the digital audio CD and the MIDI standard (both in 1982), software-only digital audio workstations in the early 1990s, real-time programmable software synthesis with Max/MSP in 1997. Such teleologies are still prevalent in video and TV technology, with the ongoing transitions from SD to HD and 4K, from DVD to BluRay, from 2D to 3D – always marketed with a similar narrative of innovation, improvement and higher fidelity of reproduction. In rejecting this narrative, Cascone and Andrews opposed the paradigm of technical quality altogether.

Ironically, the use of the term 'post-digital' was somewhat confusing in the context of Cascone's paper, since the glitch music defined and advocated here actually *was* digital, and even based on specifically digital sound-processing artefacts. On the other hand, and in the same sense as post-punk can be seen as a reaction to punk, Cascone's concept of 'post-digital' may best be understood as a reaction to an age in which even camera tripods are being labelled as 'digital', in an effort to market them as new and superior technology (see Cox 2015, this volume).

'Digital' = low-quality trash?

There is a peculiar overlap between, on the one hand, a post-digital rejection of digital high tech and, on the other hand, a post-digital rejection of digital low quality. Consider, for example, the persisting argument that vinyl LPs sound better than CDs (let alone MP3s); that film photography looks better than digital photography (let alone smartphone snapshots); that 35 mm film projection looks better than digital cinema projection (let alone BitTorrent video downloads or YouTube); that paper books are a richer medium than websites and e-books; and that something typed on a mechanical typewriter has more value than a throwaway digital text file (let alone e-mail spam). In fact, the glitch aesthetics advocated by Cascone as 'post-digital' are precisely the same kind of digital trash dismissed by 'post-digital' vinyl listeners.

Digression: What is digital, what is analogue?

Digital ≠ binary; digital ≠ electronic

From a strictly technological or scientific point of view, Cascone's use of the word 'digital' was inaccurate. This also applies to most of what is commonly known as 'digital art', 'digital media' and 'digital humanities'. Something can very well be 'digital' without being electronic, and without involving binary zeroes and ones. It does not even have to be related in any way to electronic computers or any other kind of computational device.

Conversely, 'analogue' does not necessarily mean non-computational or pre-computational. There are also analogue computers. Using water and two measuring cups to compute additions and subtractions – of quantities that cannot be counted exactly – is a simple example of analogue computing.

'Digital' simply means that something is divided into discrete, countable units – countable using whatever system one chooses, whether zeroes and ones, decimal numbers, tally marks on a scrap of paper, or the fingers (digits) of one's hand – which is where the word 'digital' comes from in the first place; in French, for example, the word is 'numérique'. Consequently, the Roman alphabet is a digital system; the movable types of Gutenberg's printing press constitute a digital system; the keys of a piano are a digital system; Western musical notation is mostly digital, with the exception of instructions with non-discrete values such as adagio, piano, forte, legato,

portamento, tremolo and glissando. Floor mosaics made of monochrome tiles are digitally composed images. As all these examples demonstrate, 'digital' information never exists in a perfect form, but is, instead, an idealized abstraction of physical matter, which, by its material nature and the laws of physics, has chaotic properties and often ambiguous states.[2]

The hipster's mechanical typewriter, with its discrete set of letters, numbers and punctuation marks, is therefore a 'digital' system as defined by information science and analytic philosophy (Goodman, 1976, 161). However, it is also 'analogue' in the colloquial sense of the word. This is also the underlying connotation in the meme image, with its mocking of 'hipster' retro culture. An art curator, on the other hand, might consider the typewriter a 'post-digital' medium.

Analogue = undivided; analogue ≠ non-computational

Conversely, 'analogue' means that the information has not been chopped up into discrete, countable units, but instead consists of one or more signals which vary on a continuous scale, such as a sound wave, a light wave, a magnetic field (for example on an audio tape, but also on a computer hard disk), the flow of electricity in any circuit, including a computer chip, or a gradual transition between colours, for example in blended paint. Goodman (1976, 160) therefore defines analogue as 'undifferentiated in the extreme' and 'the very antithesis of a notational system'.

The fingerboard of a violin is analogue: it is fretless, and thus undivided and continuous. The fingerboard of a guitar, on the other hand, is digital: it is divided by frets into discrete notes. What is commonly called 'analogue' cinema film is actually a digital–analogue hybrid: the film emulsion is analogue, since its particles are undifferentiated blobs ordered organically and chaotically, and thus not reliably countable in the way that pixels are. The combined frames of the film strip, however, are digital, since they are discrete, chopped up and unambiguously countable.

The structure of an analogue signal is determined entirely by its correspondence (analogy) with the original physical phenomenon which it mimics. In the case of the photographic emulsion, the distribution of the otherwise chaotic particles corresponds to the distribution of light rays which make up an image visible to the human eye. On the audio tape, the fluctuations in magnetization of the otherwise chaotic iron or chrome particles correspond to fluctuations in the sound wave which it reproduces.

However, the concept of 'post-digital' as defined by Cascone ignored such technical–scientific definitions of 'analogue' and 'digital' in favour of a purely colloquial understanding of these terms.

Post-digital = against the universal machine

Proponents of 'post-digital' attitudes may reject digital technology as either sterile high tech or low-fidelity trash. In both cases, they dismiss the idea of digital processing as the sole universal all-purpose form of information processing. Consequently, they also dismiss the notion of the computer as the universal machine, and the notion of digital computational devices as all-purpose media.

Prior to its broad application in audio-visual signal processing and as the core engine of mass-media consumer technology, computation had been used primarily as a means of audio-visual composition. For example, Philips ran a studio for contemporary electronic music in the 1950s, before co-developing the audio CD in the early 1980s. By this time, audio-visual computing had shifted from being primarily a means of production to a means of reproduction. Conversely, Cascone's 'post-digital' resistance to digital high-tech reproduction echoed older forms of resistance to formalist, mathematically driven narratives of progress in music production and composition – particularly the opposition to serialist composition in 20th-century contemporary music, which began with John Cage, continued with the early minimal music of La Monte Young and Terry Riley, and was further developed by improvisation/composition collectives such as AMM, Musica Elettronica Viva and Cornelius Cardew's Scratch Orchestra. After all, the serialism of Stockhausen, Boulez and their contemporaries was 'digital' in the most literal sense of the word: it broke down all parameters of musical composition into computable values which could then be processed by means of numerical transformations.

Yet most serialist music was not electronic, but composed with pen and paper and performed by orchestras. This demonstrates once again a crucial issue: unlike the colloquial meaning of the term 'digital' as commonly used in the arts and humanities, the technical–scientific notion of 'digital' can, paradoxically enough, be used to describe devices which would be considered 'analogue' or 'post-digital' in the arts and humanities.

What, then, is 'post-digital'?

(The following is an attempt to recapitulate and order some observations which I have formulated in previous publications.)[3]

Post-digital = post-digitization

Returning to Cascone and Andrews, but also to post-punk, postcolonialism and Mad Max, the term 'post-digital' in its simplest sense describes the messy state of media, arts and design *after* their digitization (or, at least, the digitization of crucial aspects of the channels through which they are communicated). Sentiments of disenchantment and scepticism may also be part of the equation, though this need not necessarily be the case – sometimes 'post-digital' can, in fact, mean the exact opposite. Contemporary visual art, for example, is only slowly starting to accept practitioners of net art as regular contemporary artists – and then again, preferably

those like Cory Arcangel, whose work is white cube-compatible. Yet its discourse and networking practices have been profoundly transformed by digital media such as the e-flux mailing list, art blogs and the electronic e-flux journal. In terms of circulation, power and influence, these media have largely superseded printed art periodicals, at least as far as the art system's in-crowd of artists and curators is concerned. Likewise, when printed newspapers shift their emphasis from daily news (which can be found more quickly and cheaply on the internet) to investigative journalism and commentary – like *The Guardian*'s coverage of the NSA's PRISM programme – they effectively transform themselves into post-digital or post-digitization media.

Post-digital = anti-'new media'

'Post-digital' thus refers to a state in which the disruption brought upon by digital information technology has already occurred. This can mean, as it did for Cascone, that this technology is no longer perceived as disruptive. Consequently, 'post-digital' stands in direct opposition to the very notion of 'new media'. At the same time, as its negative mirror image, it exposes – arguably even deconstructs – the latter's hidden teleology: when the term 'post-digital' draws critical reactions focusing on the dubious historico-philosophical connotations of the prefix 'post', one cannot help but wonder about a previous lack of such critical thinking regarding the older (yet no less Hegelian) term 'new media'.

Post-digital = hybrids of 'old' and 'new' media

'Post-digital' describes a perspective on digital information technology which no longer focuses on technical innovation or improvement, but instead rejects the kind of techno-positivist innovation narratives exemplified by media such as *Wired* magazine, Ray Kurzweil's Google-sponsored 'singularity' movement, and, of course, Silicon Valley. Consequently, 'post-digital' eradicates the distinction between 'old' and 'new' media, in theory as well as in practice. Kenneth Goldsmith notes that his students 'mix oil paint while Photoshopping and scour flea markets for vintage vinyl while listening to their iPods' (Goldsmith 2011, 226). Working at an art school, I observe the same. Young artists and designers choose media for their own particular material aesthetic qualities (including artefacts), regardless of whether these are a result of analogue material properties or of digital processing. Lo-fi imperfections are embraced – the digital glitch and jitter of Cascone's music along with the grain, dust, scratches and hiss in analogue reproduction – as a form of practical exploration and research that examines materials through their imperfections and malfunctions. It is a post-digital hacker attitude of taking systems apart and using them in ways which subvert the original intention of the design.

Post-digital = retro?

No doubt, there is a great deal of overlap between, on the one hand, post-digital mimeograph printmaking, audio cassette production, mechanical typewriter experimentation and vinyl DJing, and, on the other hand, various hipster–retro media trends – including digital simulations of analogue lo-fi in popular smartphone apps such as Instagram, Hipstamatic and iSupr8. But there is a qualitative difference between simply using superficial and stereotypical ready-made effects and the thorough discipline and study required to make true 'vintage' media work, driven by a desire for non-formulaic aesthetics.

Still, such practices can only be meaningfully called 'post-digital' when they do not merely revive older media technologies, but functionally repurpose them in relation to digital media technologies: zines that become anti-blogs or non-blogs, vinyl as anti-CD, cassette tapes as anti-MP3, analogue film as anti-video.

Post-digital = 'old' media used like 'new media'

At the same time, new ethical and cultural conventions which became mainstream with internet communities and Open Source culture are being retroactively applied to the making of non-digital and post-digital media products. A good example of this is collaborative zine conventions, a thriving subculture documented on the blog fanzines.tumblr.com and elsewhere. These events, where people come together to collectively create and exchange zines (i.e. small-circulation, self-published magazines, usually focusing on the maker's cultural and/or political areas of interest), are in fact the exact opposite of the 'golden age' zine cultures of the post-punk 1980s and 1990s, when most zines were the hyper-individualistic product and personality platforms of one single maker. If we were to describe a contemporary zine fair or mimeography community art space using Lev Manovich's *new media* taxonomy of 'Numerical Representation', 'Modularity', 'Automation', 'Variability' and 'Transcoding' (Manovich 2002b, 27–48), then 'Modularity', 'Variability' and – in a more loosely metaphorical sense – 'Transcoding' would still apply to the contemporary cultures working with these 'old' media. In these cases, the term 'post-digital' usefully describes 'new media'-cultural approaches to working with so-called 'old media'.

Do-It-Yourself vs. corporate media, rather than 'new' vs. 'old' media

When hacker-style and community-centric working methods are no longer specific to 'digital' culture (since they are now just as likely to be found at an 'analogue' zine fair as in a 'digital' computer lab), then the established dichotomy of 'old' and 'new' media – as synonymous in practice with

'analogue' and 'digital' – becomes obsolete, making way for a new differentiation: one between shrink-wrapped culture and do-it-yourself culture. The best example of this development (at least among mainstream media) is surely the magazine and website *Make*, published by O'Reilly since 2005, and instrumental for the foundation of the contemporary 'maker movement'. *Make* covers 3D printing, Arduino hardware hacking, fab lab technology, as well as classical DIY and crafts, and hybrids between various 'new' and 'old' technologies.

The 1990s/early 2000s assumption that 'old' mass media such as newspapers, movies, television and radio are corporate, while 'new media' such as websites are DIY, is no longer true now that user-generated content has been co-opted into corporate social media and mobile apps. The internet as a self-run alternative space – central to many online activist and artist projects, from *The Thing* onwards – is no longer taken for granted by anyone born after 1990: for younger generations, the internet is associated mainly with corporate, registration-only services.[4]

Semiotic shift to the indexical

The 'maker movement' – as manifested in fab labs, but also at zine fairs – represents a shift from the symbolic, as the preferred semiotic mode of digital systems (and of which the login is the perfect example), towards the indexical: from code to traces, and from text to context. 1980s post-punk zines, for example, resembled the art manifestos of the 1920s Berlin Dadaists, while 1980s Super 8 films, made in the context of the *Cinema of Transgression* and other post-punk movements, proposed underground narratives as an alternative to mainstream cinema. The majority of today's zines and experimental Super 8 films, however, tend to focus less on content and more on pure materiality, so that the medium, such as paper or celluloid, is indeed the message – a shift from semantics to pragmatics, and from metaphysics to ontology.[5]

Technically, there is no such thing as 'digital media' or 'digital aesthetics'

Media, in the technical sense of storage, transmission, computation and display devices, are always analogue. The electricity in a computer chip is analogue, as its voltage can have arbitrary, undifferentiated values within a specific range, just like a fretless violin string. Only through filtering can one make a certain sub-range of high voltages correspond to a 'zero' and another sub-range of low voltages to a 'one'. Hardware defects can cause bits to flip, turning zeroes into ones and vice-versa. Also, the sound waves produced by a sound card and a speaker are analogue, for example. This is what Kittler (1992, 81–90) refers to, somewhat opaquely, when he argues

that in computing 'there is no software'. An LCD screen is a hybrid digital–analogue system: its display is made of discrete, countable, single pixels, but the light emitted by these pixels can be measured on an analogue continuum. Consequently, there is no such thing as digital media, only digital or digitized information: chopped-up numbers, letters, symbols and any other abstracted units, as opposed to continuous, wave-like signals such as physical sounds and visible light. Most 'digital media' devices are in fact analogue-to-digital-to-analogue converters: an MP3 player with a touch-screen interface, for example, takes analogue, non-discrete gesture input and translates it into binary control instructions, which in turn trigger the computational information processing of a digital file, ultimately decoding it into an analogue electrical signal, which another analogue device, the electromagnetic mechanism of a speaker or headphone, turns into analogue sound waves. The same principle applies to almost any so-called digital media device, from a photo or video camera to an unmanned military drone. Our senses can only perceive information in the form of non-discrete signals such as sound or light waves. Therefore, anything aesthetic (in the literal sense of *aisthesis*, perception) is, by strict technical definition, analogue.

Digital = analogue = post-digital . . .?

A 'digital artwork' based on the strictly technical definition of 'digital' would most likely be considered 'post-digital' or even 'retro analogue' by art curators and humanities scholars: for example, stone mosaic floors made from internet imageboard memes, mechanical typewriter installations,[6] countdown loops running in Super 8 or 16 mm film projection, but also computer installations exposing the indexicality of electrical currents running through circuits. The everyday colloquial definition of 'digital' embraces the fiction (or, rather, the abstraction) of the disembodied nature of digital information processing. The colloquial use of 'digital' also tends to be metonymical, so that anything connected literally or figuratively to computational electronic devices – even a camera tripod – can nowadays be called 'digital'. This notion, mainly cultivated by product marketing and advertising, has been unquestioningly adopted by the 'digital humanities' (as illustrated by the very term 'digital humanities'). On the other hand, 'post-digital' art, design and media – whether or not they should technically be considered post-digital – challenge such uncritical notions of digitality, thus making up for what often amounts to a lack of scrutiny among 'digital media' critics and scholars.

Revisiting the typewriter hipster meme

The alleged typewriter hipster later turned out to be a writer who earned his livelihood by selling custom-written stories from a bench in the park.

The imageboard meme photo was taken from an angle that left out his sign, taped to his typewriter case: 'One-of-a-kind, unique stories while you wait'. In an article for the website *The Awl*, he recollects how the meme made him 'An Object Of Internet Ridicule' and even open hatred.[7] Knowing the whole story, one can only conclude that his decision to bring a mechanical typewriter to the park was pragmatically the best option. Electronic equipment (a laptop with a printer) would have been cumbersome to set up, dependent on limited battery power, and prone to weather damage and theft, while handwriting would have been too slow, insufficiently legible, and lacking the appearance of a professional writer's work.

Had he been an art student, even in a media arts programme, the typewriter would still have been the right choice for this project. This is a perfect example of a post-digital choice: using the technology most suitable to the job, rather than automatically 'defaulting' to the latest 'new media' device. It also illustrates the post-digital hybridity of 'old' and 'new' media, since the writer advertises (again, on the sign on his typewriter case) his Twitter account '@rovingtypist', and conversely uses this account to promote his story-writing service. He has effectively repurposed the typewriter from a prepress tool to a personalized small press, thus giving the 'old' technology a new function usually associated with 'new media', by exploiting specific qualities of the 'old' which make up for the limitations of the 'new'. Meanwhile, he also applies a 'new media' sensibility to his use of 'old media': user-customized products, created in a social environment, with a 'donate what you can' payment model. Or, rather, the dichotomy of community media vs. mass media has been flipped upside-down, so that a typewriter is now a community media device, while participatory websites have turned into the likes of Reddit, assuming the role of yellow press mass media – including mob hatred incited by wilful misrepresentation.

The desire for agency

Cascone and Andrews partly contradicted themselves when they defined the concept of 'post-digital' in the year 2000. Though they rejected the advocacy of 'new media', they also heavily relied on it. Cascone's paper drew on Nicholas Negroponte's *Wired* article 'Beyond Digital' (Negroponte 1998), while Ian Andrews' paper referenced Lev Manovich's 'Generation Flash', an article which promoted the very opposite of the analogue/digital, retro/contemporary hybridizations currently associated with the term 'post-digital' (Manovich 2002a). We could metaphorically describe post-digital cultures as postcolonial practices in a communications world taken over by a military–industrial complex made up of only a handful of global players. More simply, we could describe these cultures as a rejection of such dystopian techno-utopias as Ray Kurzweil's and Google's Singularity University, the Quantified Self movement and sensor-controlled 'Smart Cities'.

And yet, post-digital subculture, whether in Detroit, Rotterdam or elsewhere, is on a fundamental level not so different from such mainstream Silicon Valley utopias. For Van Meer (2012–2013), the main reason why art students prefer designing posters to designing websites is due to a fiction of agency – in this case, an illusion of more control over the medium. Likewise, 'digital' cultures are driven by similar illusions of free will and individual empowerment. The Quantified Self movement, for example, is based on a fiction of agency over one's own body. The entire concept of DIY, whether non-digital, digital or post-digital, is based on the fiction of agency implied by the very notion of the self-made.

Each of these fictions of agency represents one extreme in how individuals relate to the techno-political and economic realities of our time: either over-identification with systems, or rejection of these same systems. Each of these extremes is, in its own way, symptomatic of a *systems crisis* – not a crisis of this or that system, but, rather, a crisis of the very paradigm of 'system', as defined by General Systems Theory, itself an offshoot of cybernetics. A term such as 'post-Snowden' describes only one (important) aspect of a bigger picture:[8] a crisis of the cybernetic notion of 'system' which neither 'digital' nor 'post-digital' – two terms ultimately rooted in systems theory – is able to leave behind, or even adequately describe.

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Notes

1. Van Meer (2012–2013); also discussed later in this text.
2. Even the piano (if considered a medium) is digital only to the degree that its keys implement abstractions of its analogue-continuous strings.
3. Cramer (2012; 2013).
4. In a project on Open Source culture organized by Aymeric Mansoux with Bachelor-level students from the Willem de Kooning Academy in Rotterdam, it turned out that many students believed that website user account registration was a general feature and requirement of the internet.
5. It is debatable to which degree this reflects the influence of non-Western, particularly Japanese (popular) culture on contemporary Western visual culture, especially in the field of illustration – which accounts for an important share of contemporary zine making. This influence is even more obvious in digital meme and imageboard culture.
6. For example (and six years prior to the typewriter hipster meme), Linda Hilfling's contribution to the exhibition MAKEDO at V2_, Rotterdam, June 29–30, 2007.

7. Hermelin (2013) writes: 'Someone with the user handle "S2011" summed up the thoughts of the hive mind in 7 words: "Get the fuck out of my city." Illmatic707 chimed in: "I have never wanted to fist fight someone so badly in my entire life."'
8. A term frequently used at the Chaos Computer Club's 30th Chaos Communication Congress in Hamburg, December 2013, and also very recently by Gurstein (2014).

Works cited

Andrews, Ian (2000) Post-digital Aesthetics and the Return to Modernism. http://www.ian-andrews.org/texts/postdig.html, date accessed July 2014.

Berry, D. M. (2015) The Postdigital Constellation, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan.

Cascone, Kim (2000) The Aesthetics of Failure: 'Post-Digital' Tendencies in Contemporary Computer Music, *Computer Music Journal* 24(4): 12–18. Print.

Cox, Geoff (2013) Prehistories of the Post-digital: Some Old Problems with Post-anything. http://post-digital.projects.cavi.dk/?p=578, date accessed July 2014.

Cox, G. (2015) Postscript on the Post-digital and the Problem of Temporality, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 151–162.

Cramer, Florian (2012) Post-Digital Writing, *Electronic Book Review*. http://electronicbookreview.com/thread/electropoetics/postal, date accessed July 2014.

Cramer, Florian (2013) Post-Digital Aesthetics, *Jeu de Paume le Magazine*. http://lemagazine.jeudepaume.org/2013/05/florian-cramer-post-digital-aesthetics/, date accessed July 2014.

Eggers, Dave (2013) *The Circle*. New York: Knopf. Print.

Goldsmith, Kenneth (2011) *Uncreative Writing: Managing Language in the Digital Age*. New York: Columbia University Press. Print.

Goodman, Nelson (1976) *Languages of Art*. Indianapolis/Cambridge: Hackett. Print.

Gurstein, Michael (2014) So What Do We Do Now? Living in a Post-Snowden World. http://gurstein.wordpress.com/2014/01/01/so-what-do-we-do-now-living-in-a-post-snowden-world/, date accessed January 2014.

Hermelin, C. D. (2013) I Am An Object Of Internet Ridicule, Ask Me Anything, *The Awl*. http://www.theawl.com/2013/09/i-was-a-hated-hipster-meme-and-then-it-got-worse, date accessed July 2014.

Kittler, Friedrich (1992) There Is No Software, *Stanford Literature Review* 9: 81–90. Print.

Klok, Timo (2010) 4Chan and Imageboards, in Research Group Communication in a Digital Age (ed.) post.pic. Rotterdam: Piet Zwart Institute, Willem de Kooning Academy Rotterdam University. 16–19. Print.

Manovich, Lev (2002a) Generation Flash. http://www.manovich.net/DOCS/generation_flash.doc, date accessed July 2014.

Manovich, Lev (2002b) *The Language of New Media*. Cambridge, MA: MIT Press.

Negroponte, Nicholas (1998) Beyond Digital, *Wired* 6(12). http://web.media.mit.edu/~nicholas/Wired/WIRED6-12.html, date accessed July 2014.

Pynchon, Thomas (2013) *Bleeding Edge*. London: Penguin. Print.

Van Meer, Aldje (2012–2013) I Would Rather Design a Poster than a Website, Willem de Kooning Academy Rotterdam University. http://www.iwouldratherdesignaposterthanawebsite.nl, date accessed July 2014.

3
Genealogies of the New Aesthetic

Christiane Paul and Malcolm Levy

Whether or not you believe in the theoretical and art-historical value of the concept of a New Aesthetic – and the related buzz surrounding the labels of post-digital, post-internet, post-medium – their rapid spread throughout art networks testifies to a need for terminologies that capture a certain condition of cultural and artistic practice in the early 21st century. Some definitions of the New Aesthetic may sound like the much-parodied marketing speak one encounters at the SXSW festival, but the term still captures an important moment in the evolution of the digital realm and its impact on image and object culture.

At the core of the New Aesthetic, as originally outlined by James Bridle at SXSW[1] and on his Tumblr (Bridle 2011), seems to be a twofold operation: first, the confluence and convergence of digital technologies in various materialities; and second, the ways in which this merger has changed our relationship with these materialities and our representation as subjects. The New Aesthetic captures the embeddedness of the digital in the objects, images and structures we encounter on a daily basis and the way we understand ourselves in relation to them. It captures the process of seeing like, and being seen through, digital devices. As a construct, the New Aesthetic covers a broad territory, and the way it has been framed – as a Tumblr, which by nature emphasizes the constant 'now' of image flux – makes it hard to identify its theoretical underpinnings and narrative. (Many essays and discussions over the past couple of years have contributed to shaping that narrative.) The New Aesthetic is a blurry picture, or perhaps the equivalent of a 'poor image' as Hito Steyerl would understand it, a 'copy in motion' with substandard resolution, a 'ghost of an image' and 'a visual idea in its very becoming', yet an image that is of value because it is all about 'its own real conditions of existence' (Steyerl 2009). Despite its inherent degradation, the New Aesthetic had enough recognizability to gain meme status. As Curt Cloninger has put it,

> The New Aesthetic is not new (or it has always already been perpetually new). The fact that the NA has recently hit some sort of pop-meme

4
The Postdigital Constellation

David M. Berry

The postdigital, as an aesthetic, gestures towards a relation produced by digital *surfaces* in a bewildering number of different places and contexts. This interface-centricity is not necessarily screenic, however, and represents the current emerging asterism that is formed around notions of art, computation and design. In this conception, the postdigital is not purely a digital formation or artefact – it can also be the concepts, networks and frameworks of digitality that are represented (e.g. voxels, glitch, off-internet media, neo-analogue, 'non-digital' media, post-internet art). Nonetheless, the interesting aspect is the implicit notion of surfaces as theatres of action and performance – such as through data visualization, interactivity or material design – above and beyond a depth model, which highlights the machinery of computation (see Berry 2014, 58).

Here I am thinking not just of the surfaces created in and through the digital, but, moreover, of the kinds of logics that this inspires more broadly across society and culture. For example, I am gesturing not only to new rectangular screenic interfaces, but also to physical manifestations of thinking interfaces – flat design as a mode of thought.[1] So, for example, the 9,250 square metre simulated English village purpose-built in 2003 for the Metropolitan Police in Gravesend is in many ways an interface (BBC 2003); that is, an interface as a 'militarized non-place [...] designed for use as an immersive staging ground for police-training exercises, fighting staged riots, burglaries, bank robberies, and other crimes' that creates an 'architectural simulation embedded with *high-tech, upgradeable media*' (bldgblog 2014, emphasis added). Complete with exteriors created by mock shopfronts, estates, parks, banks and post offices, this interface is made up of surfaces and facades, in a grotesque simulacrum of a real British town (see Clarke 2008). Similarly, the interface to the computational becomes a site which is a non-place of confrontation, engagement and control.

This notion of the surface is not new, of course. Jameson (2006) famously diagnosed the logic of postmodern capitalism through an analysis of the seeming shallowness of postmodernity. However, through computation,

capitalist logics have been remediated and re-ordered relative to their softwarization, not just resulting in surfaces that wait to be read, or inscribed in such a way as to make such readings impossible or schizophrenic. Rather, surfaces themselves become *thin machinery*, containing not just the possibility of a hermeneutic encounter but also an agency drawn from computation itself. These surfaces point towards and suggest the very veneer of computation networked across the terrain of everyday life, directed towards control and surveillance. The postdigital is, then, both an aesthetic and a logic that informs the re-presentation of space and time within an epoch that is *after-digital*, but which remains profoundly computational and organized through a constellation of techniques and technologies to order things to *stand by* (Heidegger 1977).

Further, the postdigital itself can be understood as an aesthetic that revels in the possibility of revealing the 'grain of computation', or, perhaps better, showing the limitations of digital artefacts through a kind of digital glitch, or the 'aesthetics of failure' (Cascone 2000, 13). In common with the *new aesthetic*, the postdigital has been linked to the extent to which digital media have permeated our everyday lives (Berry 2012a). We could, perhaps, say that the postdigital emerges from a form of 'breakdown' practice linked to the *conspicuousness* of digital technologies (see Berry 2014, 99): not just through the use of digital tools, of course, but also a language of new media (see Manovich 2001), the frameworks, structures, concepts and processes represented by computation, and the interplay of design and aesthetics inscribed on the faces of technical devices; that is, both in the presentation of computation and in its representational modes. To explore this further, I think it is interesting to look at the way in which the 'digital' has been understood in the work of Bruno Latour by way of example, as I think he brings out many of the tensions that emerge in relation to the demand that we rethink the digital in relation to its historicity (Berry 2014).

The digital

Latour outlined his understanding of the digital in a plenary lecture at Digital Humanities 2014 conference.[2] He was exemplary in explaining that his understanding might be a product of his own individuation and pre-digital training as a scholar, which emphasized close-reading techniques and agonistic engagement around a shared text (Latour 2014). Nonetheless, in presenting his attempt to produce a system of what we might call augmented close reading through building the AIME web-reading system, he also revealed how he deployed the digital methodologically and his corresponding notion of the digital's ontological constitution.[3]

Latour first outlined a rejection of the specificity of the digital as a separate domain, highlighting both the materiality of the digital and its complex relationship with the analogue. He described the analogue structures that

underpin the digital processing that makes the digital possible (the materials, the specific electrical voltage structures and signalling mechanisms, the sheer matter of it all), but also the digital's relationship to a socio-technical environment. In other words, he swiftly moved away from what we might call the abstract materiality of the digital, its complex layering over an analogue carrier, and instead reiterated the conditions under which the existing methodological approach of actor-network theory was justified: digital forms part of a network, is 'physical' and material, requires a socio-technical environment to function, is a 'complex function' and so on.[4]

It would be too strong, perhaps, to state that Latour denied the specificity of the digital as such; rather, through a sophisticated form of 'bait and switch', he used a convincingly deployed visualization of what the digital 'really' is, courtesy of an image drawn from Cantwell-Smith (2003) to disprove notions of the digital as 'not-physical'. Indeed, this approach to the digital echoes his earlier statements from 1997 about the digital, arguing that he

> does not believe that computers are abstract ... there is (either) 0 and (or) 1 has absolutely no connection with the abstractness. It is actually very concrete, never 0 and 1 (at the same time) ... There is only transformation. Information as something which will be carried through space and time, without deformation, is a complete myth. People who deal with the technology will actually use the practical notion of transformation. From the same bytes, in terms of 'abstract encoding', the output you get is entirely different, depending on the medium you use.
>
> (Lovink and Schultz 1997)[5]

This is, therefore, not a new position for Latour; indeed, in earlier work he has stated 'actually there is nothing entirely digital in digital computers either!' (Latour 2010a, original emphasis). While this may well be Latour's polemical style, it does raise the question of what the 'digital' *is* for Latour and how his definition enables him to make such strong claims. One is tempted to suppose that it is the materiality of the zeroes and ones that Cantwell-Smith's diagram points towards that enables Latour to dismiss out of hand the complex abstract digitality of the computer as an environment. Hence, ironically, Latour is perhaps too accepting of the materiality of a representation *of* the materiality of computation. Indeed, this causes him to miss the aspect by which, although not immaterial, the digital is constituted through a complex series of abstraction layers which actually do enable programmers to work and code in an abstract machine disconnected in a *logical* sense from the materiality of the underlying silicon. Indeed, without this abstraction *within* the space of digital computers there could be none of the complex computational systems and applications that are built today on abstraction layers. Thus, in computation, space is deployed

both in a material sense, as the shared memory abstracted across both memory chips and the hard disk (which itself may be memory chips), and as a metaphor for the way in which the space of computation is produced through complex system structures that enable programmers to work within a notionally two-dimensional physical address space that is abstracted onto a multidimensional structure.

In any case, while our attention is distracted by this assertion, Latour moves to cement his switch by making the entirely reasonable claim that the digital lies within a socio-technical environment, and that the way to study the digital is therefore to identify *what is observable of the digital*. It is precisely the claim to an observable dimension to the digital that I think the postdigital as a concept makes manifest. Latour claims that we should observe 'segments of trajectories through distributed sets of material practice only some of which are made visible through digital traces'; thus, he claims the digital is *digital* less as a domain and more as a set of practices – or, perhaps, that the digital is better understood as an inscription device for capturing, or remediating, practice. This approach to studying the digital is, of course, completely reasonable, provided one is cognizant of the way in which the digital in our postdigital world resembles the structure of an iceberg, with only a small part ever visible to everyday life – even to empirical researchers (see Figure 4.1). It seems to me that ethnographic approaches that declare the abstractness of the digital *a priori* illegitimate as a research object lose the very specificity of the digital called for by their well-meaning attempt to capture the materiality of the digital. Indeed, the way in which the digital, through complex processes of abstraction, is then able to provide mediators to and interfaces over the material is one of the key research questions to be unpacked when attempting to get a handle on the increasing proliferation of the digital into 'real' spaces (see Dieter 2015, this volume). As such, ethnographic approaches will only ever be part of a set of research

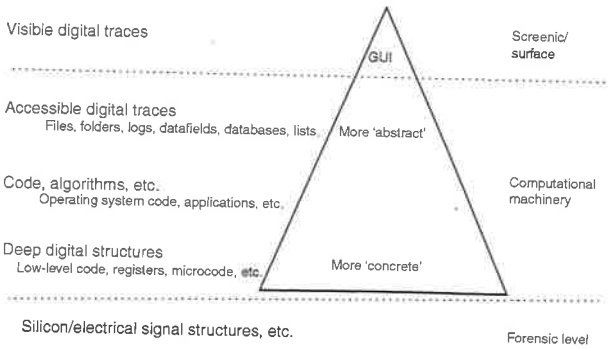

Figure 4.1 The digital iceberg

approaches for the study of the digital, rather than, as Latour claims, the only, or most important, research methodology.

This is significant because research agendas, and hence research funds, are increasingly coalescing around the digital. Thus, due to financial pressures and research grants being given to engage with 'digital' society, and the now manifest presence of the digital in all aspects of life, we see claims about which methodological and theoretical approaches should be used to understand the 'digital'. Should one undertake digital humanities or computational social science, or apply digital sociology, computational media studies, or some other approach, such as actor-network theory? Latour's claim that 'the more thinking and interpreting becomes traceable, the more humanities could merge with other disciplines' reveals the normative line of his reasoning that the specificity of (digital) humanities as a research field could be usurped or supplemented by approaches that Latour himself thinks are better at capturing the digital (Latour 2014). Indeed, Latour claims in his book *Modes of Existence* that his project, AIME, 'is part of the development of something known by the still-vague term "digital humanities," whose evolving style is beginning to supplement the more conventional styles of the social sciences and philosophy' (Latour 2013, xx).

To legitimate Latour's claim of actor-network theory as a kind of queen of the sciences in relation to the digital, he refers to Boullier's (2014) work *Pour des sciences social de çéme generation* (quoted in Latour 2014). Boullier argues that there have been three ages of social context, with the latest emerging from the rise of digital technologies and the capture of digital traces they make possible. They are:

> Age 1: Statistics and the idea of *society*
> Age 2: Polls and the idea of *opinion*
> Age 3: Digital traces and the idea of *vibrations*.
>
> (quoted in Latour 2014)

Here, 'vibration' follows from the work of Gabriel Tarde, who in 1903 referred to the notion of 'vibration' in connection with an empirical social science of data collection, arguing that

> a time may come when upon the accomplishment of every social event a figure will at once issue forth automatically, so to speak, to take its place on the statistical registers that will be continuously communicated to the public and spread abroad pictorially by the daily press. Then, at every step, at every glance cast upon poster or newspaper, we shall be assailed, as it were, with statistical facts, with precise and condensed knowledge of all the peculiarities of actual social conditions, of commercial gains or losses, of the rise or falling off of certain political parties, of the progress or decay of a certain doctrine, etc., in exactly the same way as we are assailed when we open our eyes by the vibrations of the ether which tell us of the approach or withdrawal of such and such a so-called body and of many other things of a similar nature.
>
> (Tarde 1903/1962, 167–168)

Thus, the notion of vibration, to which Latour points, is given in the idea of *sublata* (similar to *capta*, or captured data). For Latour, the datascape is that which is captured by the digital, and this digitality allows us to view *a few* segments, thus partially making visible the connections and communications of the social, understood as an actor-network. It is key here to note the focus on the visibility of the representation made possible by the digital, which becomes not a processual computational infrastructure but, rather, a set of inscriptions on a surface. These can then be collected by the keen-eyed ethnographer to help reassemble the complex socio-technical environments of which the digital forms a part. The social is, then, in some senses an interface on which the traces of complex social interactions between actants in a network are written, but only ever a repository of *some* of these traces. Thus, we might say that an algorithmic society is readable through a veneer made manifest through the digital, understood as a patina, so that 'for now we see through a glass, darkly' (Corinthians 13.12), through the mediators and mediation of the thin machinery of computation.

Latour (2014) argues that the digital is not a domain or a sphere, but a single entry into the materiality of interpreting complex data (*sublata*) within a collective of fellow co-inquirers. He reiterates his point about the downgraded status of the digital as a problematic within social research and its pacification through its articulation as an inscription technology (similar to books) rather than machinery in and of itself. This shows us again, I think, that Latour's understanding of the digital is correspondingly problematic, and also unhelpful in trying to unpack the *post*-digital.

The use of the 'digital' in such a desiccated form points to the limitations of Latour's ability to engage with the research programme of investigating the digital, but also the way in which a theologically derived close-reading method derived from bookish practice may not be entirely appropriate for unpacking and 'reading' computational media and software structures.[6] It is not that the digital does not leave traces, as patently it does; rather, it is that these traces are encoded in such a form, at such quantities and high resolutions of data compression that in many cases human attempts to read this information inscription directly are fruitless, and instead require the mediation of software, and hence a double-hermeneutic which places human researchers twice (or more) removed from the inscriptions they wish to examine and read. This is not to deny the materiality of the digital, or of computation itself, but it certainly makes the study of such matter and practices much more difficult than the claims to visibility that Latour presents.

It also suggests that Latour's rejection of the abstraction in and of computation that electronic circuitry makes possible is highly problematic and ultimately flawed.

The postdigital constellation

In response to Latour's formulation, I would like to offer a contextualization of the digital by way of exploring the notion of the 'postdigital constellation'. This is to use the postdigital in an approach that looks to interrogate the original theoretical legacy of early critical theory, and also explores its concepts and ideas in the light of computation and the postdigital condition (see Berry 2014). This is to connect back the implications of computational imaginaries, particularly hegemonic representations of the digital – 'postdigital aesthetics', 'new aesthetic', 'pixels', 'sound waves', 'interfaces', 'surface' and so forth – in relation to the digital itself. As computation has become spatial in its implementation, embedded within the environment, in the body and in society, it becomes part of the texture of life itself which can be walked around, touched, manipulated and interacted with in a number of ways. So 'being online' or 'being offline' is now anachronistic, with our always-on smart devices, tablets and hyper-connectivity, as, indeed, is the notion that we have 'digital' and 'analogue' worlds that are disconnected or discrete. Today the postdigital is hegemonic, and as such is entangled with everyday life and experience in a highly complex, messy and difficult to untangle way that is different from previous instantiations of the digital – indeed, the varieties of the digital should be treated as historical in this important sense.

Kracauer (1995) wrote that we must rid ourselves of the delusion that it is the major events which have the most decisive influence on us.[7] We are much more deeply and continuously influenced by what he called 'the tiny catastrophes that make up daily life'. As such, we need a consistent, interdisciplinary attempt to articulate the material construction of a historically specific social reality; that is, a focus on the impoverished but potentially revelatory landscape of everyday life – today represented increasingly by social media, technical devices and real-time streams (Berry 2011). Kracauer argues that the position that an epoch occupies in the historical process can be determined more strikingly from an analysis of its inconspicuous surface-level expressions than from that epoch's judgements about itself. These surface-level expressions provide access to the state of things, because through their organization, computationally and aesthetically, elements that were 'strewn helter-skelter' suddenly become meaningfully related. This connection with a notion of the postdigital is, therefore, suggestive.

For Kracauer, the ornamental patterns produced by groups of dancers, for example, are the aesthetic reflex of the rationality to which the prevailing economic system aspires. He calls this the 'mass ornament', which is not simply a superstructural reflection of the prevailing mode of production. Rather, Kracauer reads the geometry of contemporary patterns and ordering as an ambivalent historico-philosophical allegory, insisting that they are also a *mise-en-scene* of disenchantment. Thus, the mass ornament manifests progressive potential as the representation of a new type of collectivity, organized not according to bonds of a community but as a social mass of functionally linked individuals.

The postdigital constellation similarly resembles aerial photography of landscapes and cities, in that it does not emerge out of the interior of the given conditions, but, rather, appears above them – granting a distant reading of culture, society and everyday life. In the midst of a world which has become blurred and ungraspable, the postdigital constellation becomes a primary element, an object for a cultural analytics that provides connection and a sense of cohesion in a fragmentary digital experience. The relation to the postdigital constellation is an aesthetic mode, an ornament that becomes an end in itself – via data visualizations, interfaces, surfaces, habitual media and veneers of glass (see also Chun 2015; Cubitt 2015, this volume).

So the postdigital constellation could be said to figuratively consist of lines and circles, as in Euclidean geometry, but also waves and spirals. These formations are still in some sense opaque, composed as they are according to the dictates of a rationality that sacrifices meaning for the sake of an abstract unity of reified elements. Here, I am thinking about the computational rationalities of the database: the collection, the stream and the file. Thus, the postdigital constellation suspends the opposition of the merely decorative applied ornament and the functional structure – the interface is, in reality, thin machinery mediating and remediating computation.

Thus, the interface produces both an ornamentation of function and a functionalization of ornament, and, by critically examining the very superficiality of the postdigital constellation as a surface, one can further explore the computational practices that underwrite and mediate this affinity with the surface. Reading algorithms, for example, opens the material expressions of a particular historical condition. This has been explored by the Synchronous Objects Project, created by Ohio State University and The Forsythe Company project, which aims to build a large set of data-visualization tools for understanding and analysing the interlocking systems of organization in the choreography of William Forsythe's 'One Flat Thing'.[8] Here, dance was quantified through the collection of data and transformed into a series of objects called 'synchronous objects' – we might think of these as an example of an asterism of the postdigital constellation – that work in harmony to explore those choreographic structures, reveal their patterns, and re-imagine them through data-visualization techniques. In some senses, this is the de-temporalization of movement, creating a spatial map formed by the aggregate of dancers' movements. A further gesture towards the postdigital

constellation is made by the artist, Natalie Bookchin, in her installation and video, Mass Ornament. She writes:

> In Mass Ornament a mass dance is constructed from hundreds of clips from YouTube of people dancing alone in their rooms... Today, YouTube dancers, alone in their rooms performing a routine that is both extremely private and extraordinarily public, reflect a post-Fordist era. Millions of isolated spectator/workers in front of their screens move in formation and watch dancers moving in formation alone in their rooms, also in front of their screens.
>
> (Bookchin 2009)

We might say that the algorithm that instantiates the postdigital captures the remnants that history has left behind; the same mere nature that appears in the algorithm is thriving in the reality of the society created by capitalist rationality, for example, in new social media obsessions with consumption and conspicuous compensatory leisure, sedimented issues of gender, or in politics and norms. The postdigital serves to train people in those forms of perceptions and reactions which are necessary for any interaction with computational devices. Indeed, the representational practices of the postdigital display an elective affinity with the surface, not the knowledge of an original but the spatial configuration of an instant. In some sense, the postdigital stages nature and everyday life as the negativity of history through the mediation of design.

This leads to a theoretical and sociological challenge in terms of how critical theory can be deployed to think through this historical constellation. Questions of aesthetics, politics, economics, society and the everyday need to be reflected on in relation to the computational precisely because of the penetration of computation into all aspects of human life. This is a call to more rigorous scholarship in relation to the postdigital, but also towards a praxis linked to critical practice and a critical approach to the aesthetic of computation and its mediating role both in and through computation.

The postdigital can be thought of as an abductive aesthetic (or *pattern aesthetic*) and linked by a notion of computational patterns and pattern recognition as a means of cultural expression. By this I mean that, as computational ontologies and categories become increasingly dominant as instrumental and aesthetic values, they also become influential as economic, political, communicative and aesthetic concepts. Patterns, drawing on the ideas of Christopher Alexander, can be defined as follows:

> As an element of language, a pattern is an instruction, which shows how this spatial configuration can be used, over and over again, to resolve the given system of forces, wherever the context makes it relevant. The pattern is, in short, at the same time a thing, which happens in the world, and the rule which tells us how to create that thing, and when we must create it. It is both a process and a thing; both a description of a thing which is alive, and a description of the process which will generate that thing.
>
> (Alexander 1979, 247)

Patterns are also deeply concerned with computer pattern recognition, repeated elements, codes and structural elements that enable *something* to be recognized as a *type* of *thing*. This is not just visual, of course, and patterns may be recognized in data sets, textual archives, data points, distributions, non-visual sensors, physical movement or gestures, haptic forces, and so on. Indeed, this points to the importance of information visualization as part of the abduction aesthetic in order to 'visualize' the patterns that are hidden in sets of data. This is also the link between the postdigital and the digital humanities (see Berry 2012b; Gold 2012).

One can think of an abductive aesthetic as a bounded aesthetic linked inextricably with the computational and the foundation for developing a *cognitive map* (Jameson 2006, 516). The fact that *abduction aesthetics* are networked, shareable, modular, 'digital' and located in both the digital and analogue worlds is appropriate, as they follow the colonization of the lifeworld by the technics of computationality.

So, a return to Bridle's (2012) *New Aesthetic* collection shows how his project is indeed symptomatic of an emerging aesthetic, an admittedly haphazard and disparate collection of objects placed within a Tumblr blog that is presented to the user as a stream of data. The collecting of these digital and pseudo-digital objects is deeply influenced by a computational frame, and, indeed, the very collection is made possible through new forms of computational curation tools, such as Tumblr and Pinterest, which are essentially new interfaces to the databases that lie behind.

The postdigital suggests that an *abduction aesthetic* will become more prevalent, and it will be interesting to see the exemplars emerge. While today we tend to think of 8-bit pixelation, geometric patterns, satellite photos, CCTV images and the like in relation to computational aesthetics, it is probable that alternative, more computational forms that build from the interface as the thin machinery of computation will emerge. Conceivably, this might also lead to a form of cognitive dissonance, with people looking for *pattern aesthetics* everywhere, understood as a form of apophenia, that is, the experience of seeing meaningful patterns or connections in random or meaningless data (called a Type 1 error in statistics). Perhaps even further, people will seek digital or abductive *explanations* for certain kinds of aesthetic, visual or even non-visual experiences which may not be digital or produced through computational means at all, a *digital pareidolia*.[9]

The postdigital is a concept that stands in for, or conceptualizes, the notion of the computational as a network of digital surfaces in a number

of different places and contexts. The postdigital can be said to constitute the *pattern*, the asterism, that is distinctive of our age, but it impresses itself on the new as well as the traditional. Thus, history is recast within the terms of the postdigital. In other words, we tend to look backwards with computational 'eyes' and reconstruct the past *as if* computationally 'found patterns' had been influential on making, drawing, writing or creating culture more generally.

Ironically, this is happening at a time when most people's command of digital technology is weak and their understanding of the politics of technology minimal. The postdigital might, then, in its popular manifestations, and as evidenced by Bridle (2012) and Sterling (2012), actually gesture towards a weak form of understanding of the computational and its representation – perhaps even an attempt at a *domestication* in the sense given by Silverstone (2003). This seems especially important when we look critically at the suggested methods proposed by Latour and others and their disavowal in relation to the computational. Indeed, at the level of the interface, which often re-presents not the presently existing computational but a simplified version in, for example, flat design, 8-bit graphics or blocky visuals, we see that the surface actually detracts from understanding what Lash (2007) called 'algorithmic power'.

In this chapter, I have explored the question raised by the postdigital in relation to Latour's notion of the digital and in light of the entanglement of the computational and capitalism. By drawing from critical theory to think about the possibility of surfacing the digital through re-presentation and mediation, a new constellation is made visible. Thus, the postdigital as an asterism usefully contributes to a sense of reality, a growing sense or suspicion towards the digital, a sense of the limits or even the absolute, because experienced reality beyond everyday life is hidden or obfuscated for most members of society. The postdigital is, therefore, specific to the more general problematic raised in relation to the question of reason and emancipation in a computational society, and one in which the intentionality of the black boxes of technology is increasingly divined from their surfaces.

Notes

1. It is important to note that interfaces are not just visual; they can also be algorithmic, for example application programming interfaces (APIs).
2. Bruno Latour is professor at Sciences Po and director of the TARDE programme (Theory of Actor-Network and Research in Digital Environments). The programme name is presumably intended to invoke the name of Jean-Gabriel De Tarde, more commonly known as Gabriel Tarde (1843–1904), a French sociologist who used the concepts of imitation, repetition and habit through a sociology of networks made up of individuals to explore the emergence of sociality.
3. Accepting the well-designed look of the AIME Project website, there can be no disputing the fact that the user experience is shockingly bad. Not only is the layout of the web version of the book completely unintuitive, but the process of finding information is clumsy and annoying to use. One can detect the faint glimmer of a network ontology guiding the design of the website, an ontology that has been forced onto the usage of the text rather than organically emerging from use; indeed, the philosophical inquiry appears to have influenced the design in unproductive ways. Latour himself notes: 'although I have learned from studying technological projects that innovating on all fronts at once is a recipe for failure, here we are determined to explore innovations in method, concept, style, and content simultaneously' (Latour 2013, xx). I have to say that unfortunately I do think that there is something rather odd about the interface that means that the recipe has been unsuccessful. In any case, it is faster and easier to negotiate the book via a PDF file than through the web interface, or certainly it is better to keep ready to hand the PDF or the paper copy when waiting for the website to slowly grind back into life.
4. Latour has an unexpected similarity to the German Media School, in relation to the materiality of the digital as an explanatory and sufficient level of analysis.
5. See also Latour stating:

> the digital only adds a little speed to [connectivity]. But that is small compared to talks, prints or writing. The difficulty with computer development is to respect the little innovation there is, without making too much out of it. We add a little spirit to this thing when we use words like universal, unmediated or global. But if we say that, in order to make visible a collective of 5 to 10 billion people, in the long history of immutable mobiles, the byte conversion is adding a little speed, which favours certain connections more than others, then this seems a reasonable statement.
>
> (Lovink and Schultz 1997)

6. The irony of Latour (2014) revealing the close-reading practices of actor-network theory as a replacement for the close-reading practices of the humanities/digital humanities is interesting (see Berry 2011), particularly in relation to his continual reference to the question of distant reading within the digital humanities and his admission that actor-network theory offers little by way of distant reading methods. Latour (2010b) explains:

> under André Malet's guidance, I discovered biblical exegesis, which had the effect of forcing me to renew my Catholic training, but, more importantly, which put me for the first time in contact with what came to be called a network of translations – something that was to have decisive influence on my thinking... Hence, my fascination for the literary aspects of science, for the visualizing tools, for the collective work of interpretation around barely distinguishable traces, for what I called inscriptions. Here too, exactly as in the work of biblical exegesis, truth could be obtained not by decreasing the number of intermediary steps, but by increasing the number of mediations.
>
> (Latour 2010b, 600–601, emphasis removed)

7. Siegfried Kracauer (1889–1966) was a German journalist, sociologist, cultural critic and film theorist, an early member of the Frankfurt School, whose works were influential on Walter Benjamin and Theodore Adorno.
8. I would like to thank Maaike Bleeker for introducing me to these works at the 4M conference in Utrecht, 5 June 2014.

9. Pareidolia involves seeing importance in vague and random phenomena, for example a face in a random collection of dots on paper. By 'digital pareidolia' I am gesturing towards seeing digital causes for things that happen in everyday life. Indeed, under a regime of computation in the future it might be considered stranger to believe that things might have non-digital causes. Thus, apophenia would be the norm in a highly digital computational society, perhaps even a significant benefit to one's life chances and well-being if finding patterns become increasingly lucrative. Here we might consider the growth of computational high-frequency trading and financial systems that are trained and programmed to identify patterns very quickly.

Bibliography

Alexander, C. (1979) *The Timeless Way of Building*. Oxford: Oxford University Press.

BBC (2003) New £50m Police Training Centre Opens, *BBC News*. http://news.bbc.co.uk/1/hi/england/kent/2948855.stm, date accessed 10 October 2014.

Berry, D. M. (2011) *The Philosophy of Software: Code and Mediation in the Digital Age*. Basingstoke: Palgrave Macmillan.

Berry, D. M. (2012a) The Social Epistemologies of Software, *Social Epistemology* 26(3–4): 379–398.

Berry, D. M. (2012b) *Understanding Digital Humanities*. Basingstoke: Palgrave Macmillan.

Berry, D. M. (2014) *Critical Theory and the Digital*. New York: Bloomsbury.

BLDGBLOG (2014) The Civic Minimum. http://bldgblog.blogspot.co.uk/2014/10/the-civic-minimum.html, date accessed 13 October 2014.

Bookchin, N. (2009) Mass Ornament. http://bookchin.net/projects/massornament.html, date accessed 6 June 2014.

Bridle, J. (2012) The New Aesthetic. http://new-aesthetic.tumblr.com/, date accessed 5 April 2012.

Cantwell-Smith, B. (2003) Digital Abstraction and Concrete Reality, in *Impressiones*. Madrid: Calcografia Nacional.

Cascone, K. (2000) The Aesthetics of Failure: 'Post-Digital' Tendencies in Contemporary Computer Music, *Computer Music Journal* 24(1): 12–18.

Chun, W. K. C. (2015) Networks NOW: Belated Too Early, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 290–316.

Clarke, C. (2008) Gravesend – The Death of Community. https://www.flickr.com/photos/chris-clarke/sets/72157627388065874, date accessed 10 October 2014.

Cubitt, S. (2015) Data Visualisation and the Subject of Political Aesthetics, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 179–190.

Dieter, M. (2015) Dark Patterns: Interface Design, Augmentation and Crisis, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 163–178.

Gold, M. K. (2012) *Debates in the Digital Humanities*. Minneapolis: University of Minnesota Press.

Heidegger, M. (1977) *The Question Concerning Technology and Other Essays*. London: Harper & Row.

Jameson, F. (2006) Postmodernism or the Cultural Logic of Late Capitalism, in Kellner, D. and Durham, M. G. (eds.) *Media and Cultural Studies Keyworks*. London: Blackwell. 482–519.

Kracauer, S. (1995) *The Mass Ornament*. Cambridge: Harvard University Press.

Lash, S. (2007) Power after Hegemony Cultural Studies in Mutation? *Theory, Cultural & Society*, 24(3): 55–78.

Latour, B. (2010a) The Migration of the Aura or How to Explore the Original through Its Fac Similes, in Bartscherer, T. (ed.) *Switching Codes*. Chicago: University of Chicago Press. 275–297.

Latour, B. (2010b) Coming Out as a Philosopher, *Social Studies of Science* 40(4): 599–608.

Latour, B. (2013) *An Inquiry into Modes of Existence: An Anthropology of the Moderns*. Cambridge: Harvard University Press.

Latour, B. (2014) Opening Plenary, Digital Humanities 2014 (DH2014). http://dh2014.org/videos/opening-night-bruno-latour/, date accessed 5 October 2014.

Lovink, G. and Schultz, P. (1997) There Is No Information, Only Transformation: An Interview with Bruno Latour. http://thing.desk.nl/bilwet/Geert/Workspace/LATOUR.INT.

Manovich, L. (2001) *The Language of New Media*. Cambridge, MA: MIT Press.

Silverstone, R. (2003) *Why Study the Media?* London: Sage.

Sterling, B. (2012) An Essay on the New Aesthetic, *WIRED*. http://www.wired.com/beyond_the_beyond/2012/04/an-essay-on-the-new-aesthetic/, date accessed 5 April 2012.

Tarde, G. (1903/1962) *The Laws of Imitation*. New York: Henry Holt and Company.

Turkle, Sherry (1997), *Life on the Screen: Identity in the Age of the Internet*. New York: Simon & Schuster.
Wajcman, Judy (1991) *Feminism Confronts Technology*. Pennsylvania: Penn State University Press.
Williams, Alex and Srnicek, Nick (2013) @Accelerate Manifesto for an Accelerationist Politics, *Critical Legal Thinking*. http://criticallegalthinking.com/2013/05/14/accelerate-manifesto-for-an-accelerationist-politics/. (Date accessed 9 March, 2015).
Zylinska, Joanna (2009) *Bioethics in the Age of New Media*. London: MIT Press.

12

Postscript on the Post-digital and the Problem of Temporality

Geoff Cox

According to Florian Cramer, the 'post-digital' describes an approach to digital media that no longer seeks technical innovation or improvement, but considers digitization as something that has already happened and thus might be further reconfigured (2013; Cramer 2015, this volume). He explains how the term is characteristic of our time, in that shifts of information technology can no longer be understood to occur synchronously – and gives examples across electronic music, book and newspaper publishing, electronic poetry, contemporary visual arts and so on. These examples demonstrate that the ruptures produced are neither absolute nor synchronous, but instead operate as asynchronous processes, occurring at different speeds and over different time periods, and are culturally diverse in each affected context. As such, the distinction between 'old' and 'new' media is no longer useful.

Yet, despite the qualifications and examples, there appears to be something inherently anachronistic about the term 'post-digital' – as with older 'posts' that have announced the end of this and that. As Cramer acknowledges, one of the initial sources of the term occurs in Kim Cascone's essay 'The Aesthetics of Failure: Post-Digital Tendencies in Contemporary Computer Music' (2000), and, significantly, in his later reassessment of his position in 'The Failures of Aesthetics' (2010), where he laments the ways in which aesthetics have been effectively repackaged for commodification and indiscriminate use. The past in this way is reduced to the idea of a vast database of surface images without referents (think of Facebook) that can be endlessly reassigned to open up new markets and establish new value networks. The artist-theorist Hito Steyerl claims something similar in her discussion of 'post-cinema', describing it as a training programme for conformism as part of the 'military-industrial-entertainment' complex. Under these conditions, in which data goes beyond the screen, 'too much world' (the title of her essay) becomes available and reality itself is 'postproduced' (2013) – as are social relations in repressive form.

In this essay I want to speculate on the connection between the popularization of the term 'post-digital' and a wider cynicism towards the possibility of social transformation. The concept seems entangled with other forces that disavow a politics of time, rendering us unable to participate in or even recognize the transformative potential of historical processes (see also Chun 2015; Parikka 2015, this volume). The essay will stress this political problem of temporality by making reference to some of the discussions around the logic of historical periodization, the rise of the term 'contemporaneity' in aesthetic theory, and microtemporality in media archaeology. To be polemic, I want to argue that we do not really need new concepts like the post-digital (or new aesthetics for that matter), but, rather, need to rethink the deep structures of temporalization that render our present the way it is.

Precedence for this approach might be initially found in Frederic Jameson's critique of 'postmodernity' at the height of its popularity in the early 1990s – although by now it has become a mostly discredited term. He identified the dangers of conceptualizing the present historically in an age that seems to have forgotten about history. The claims of 'new aesthetics' to expose the limits of human apperception or of the 'post-digital' to collapse some of the mythologies of the digital do not seem to acknowledge their own historical conditions or time dimensions sufficiently well. It would seem that useful parallels can be drawn between a critique of post-history and the notion of the post-digital to speculate on the inherent, but largely unacknowledged, periodizing logic, and to understand why new terms arise at particular moments and what they displace in this process. In *The Cultural Logic of Late Capitalism*, Jameson claims that the historical present has been colonized by 'pastness', displacing 'real' history (1991, 20). Has something similar occurred?

It is not that new kinds of historical knowledge do not emerge with changes in production; this necessarily happens as an integral part of historical processes. But let us not forget the process by which concepts become appropriated by the addition of various updates and the use of the prefix 'post'. An example here would be Francis Fukuyama's use of the Hegelian assertion of the end of history (1992) – a notion of history that culminates in the present – to insist on the triumph of neoliberalism over its alternatives. This is a reference to Hegel's *Phenomenology of Spirit* (1807), but also to Alexandre Kojève's *Introduction à la lecture de Hegel: Leçons sur 'La Phénoménologie de l'Esprit'* (1947) and his 'postscript on post-history and post-historical animals', in which he argued that certain aesthetic attitudes have replaced the more traditional 'historic' commitment to the truth.

Jameson claims that cultural changes are bound to changing modes of production and related periodizations, through which social relations can be identified. For instance, he contrasts conceptions of cultural change within modernism, expressed as an interest in all things 'new', with postmodernism's emphasis on rupture, indicated by the addition of 'post'.

To Jameson, what might be considered to be a distinct break from what went before clearly contains residual traces of it ('shreds of older avatars', as he puts it). This is exemplified by the very use of the prefix, which both breaks from and keeps connection with the term in use through the grammatical gesture of a hyphen. So, rather than indicating a distinct paradigm shift from modernism, Jameson concludes that postmodernism is 'only a reflex and a concomitant of yet another systemic modification of capitalism itself' (1991: xii), and thereby offers insights into the contemporary mode of the commodification of culture and aesthetic production. The term reveals the inherent contradictory nature of any claims associated with it.

Making reference to Daniel Bell's phrase 'postindustrial society', popular at the time of writing, Jameson argues instead for the term 'late capitalism' (allegedly taken from Adorno) in order to reject the view that new social formations no longer obey the laws of industrial production, and so to stress the importance of class relations. Here he is also drawing upon the work of the Marxist economist Ernest Mandel in *Late Capitalism* (1972), who argued that this third stage of capital was, in fact, capitalism in a purer form – with its relentlessly expanding markets and guarantee of the cheapest workforce. If we follow this line of logic, how do we understand the post-digital under the conditions of informational capitalism? What are its breaks and residual traces? What is being displaced?

* * *

To proceed with the discussion, it should be understood that Jameson adopts Mandel's 'periodizing hypothesis' or 'long wave theory' of expanding and stagnating economic cycles to explain developmental forces of production. Growth is explained in parallel to the previous period's stagnation. Three general revolutions in technology are described, in close relation to the capitalist mode of production since the 'original' Industrial Revolution of the late 18th century: machine production of steam-driven motors since 1848; machine production of electric and combustion motors since the 1890s; machine production of electronic and nuclear-powered apparatuses since the 1940s (Mandel 1972, 119). Correspondingly, Jameson characterizes these as: market capitalism; monopoly capitalism, or the stage of imperialism; and multinational capitalism (1991, 35) – each expanding capital's reach and effects. He then relates these economic stages directly to cultural production, as follows: realism – worldview of realist art; modernism – abstraction of high modernist art; and postmodernism – pastiche.

Although the model may seem rather crude and over-determined, these developments are to be taken as uneven and layered, without clean breaks or ruptures, as previously explained. Each subsequent periodization is a negation of the previous one, but is then also negated, and so on. As an aside, the acknowledgement of what lies historically repressed provides a further link

to Hal Foster's *The Anti-Aesthetic*, and his defence of Jameson's adoption of the long wave theory as a 'palimpsest of emergent and residual forms' (2002, 207), but he would add that it is not sensitive enough to different speeds or to the idea of 'deferred action' (which he takes from Freud's 'the return of the repressed'). This aspect is important for any psychoanalytical conception of time, and implies a complex and reciprocal relationship between an event and its later reinvestment with meaning. However, rather than speculating on characterizing a further stage related to digital computation and a suitable term to assign to this, my point here is to stress that what we need is more reflection on periodizing logic in itself as a form of historical temporality in order to understand the conceptual logic that underpins the way we identify periods, movements, styles and techniques as forms of time more broadly. This is what Peter Osborne also outlines in his discussion of the temporalities of 'avant-garde', 'modern' and 'contemporary' – terms that have been largely taken for granted in the aesthetic field (2012–2013).

Osborne calls for more philosophical attention to how such terms are constituted and to avoid simply using references that become fashionable at certain points in time. His argument, itself periodizing of course, reminds us that, although art is rarely of direct political significance, it does, however, contribute to a critical reflection on political subjectivation, and does so through forms of historical temporalization. That politics is necessarily related to a conception of historical time in this way is clearly a contestable position (Osborne points to the emancipatory politics of Alain Badiou and Jacques Ranciere as examples of those who reject this (historical) role of/for history; 2012–2013, 30), but his point is that the problem of temporality remains an issue regardless. It remains an ongoing problem that simply must be addressed in political discussions.

The lack of recognition that terms such as the post-digital are periodizing concepts can be seen to be part of the problem. Osborne's contention is that terms like this are constructed at the level of history as a whole, and so become powerful formulations.

> More specifically, they are categories of historical totalization in the medium of cultural experience. As such, each involves a distinct form of historical temporalization – a distinct way of temporalizing 'history' – through which the three dimensions of phenomenological or lived time (past, present and future) are linked together within the dynamic and eccentric unity of a single historical view.
>
> (Osborne 1995, ix)

Attention to time is Osborne's way to address the problem of conceptualizing historical change, but also to reconcile aspects of totalization – such as in forms of Marxist Hegelianism. (A further paradox is the familiar critique of postmodernism: that, in its critique of totalizing narratives such as Marxism,

it became a totalizing theory itself.) His use of the term 'contemporary' can thus be seen to be strategic:

> As a historical concept, the contemporary thus involves a projection of unity onto the differential totality of the times of lives that are in principle, or potentially, present to each other in some way, at some particular time – and in particular, 'now', since it is the living present that provides the model of contemporaneity. That is to say, the concept of the contemporary projects a single historical time of the present, as a living present – a common, albeit internally disjunctive, historical time of human lives. 'The contemporary', in other words, is shorthand for 'the historical present'. Such a notion is inherently problematic but increasingly irresistible.
>
> (Osborne 2010)

The term becomes useful to deal with the complexities of time and history, if not politics, in ways that neither modernism nor postmodernism seems able to capture any more. Rather the contemporary serves to express a 'deepening *contradictory complication* of temporal forms' (Osborne 2012–2013, 31).

The purpose here, in keeping with Walter Benjamin, is to maintain a political view of the past that is not simply a historical one – to highlight the politics of history. Benjamin's 'On the Concept of History' (written in 1940) rejects historicist notions of the past as a continuum of progress – including, of course, Hegelian teleological notions of the end of history, and, arguably, historical materialism itself (Benjamin 2003). It presents a complex argument with its evocative opening reference to the machine built by Wolfgang von Kempelen in 1769 – a chess-playing automaton dressed in Turkish attire that wins every time it plays – to demonstrate that the dynamic of history (like that of the machine) is fake. The task of the historical materialist, it is argued, is to reveal the inner workings of historicism as an ideological construction, so that it can be further modified. Moreover, the emphasis on deepening contradictory complication is necessary to maintain a political view of the past that is not simply a historical one – to highlight the political temporalization of history.

The crisis of capitalism that we have experienced since the global financial crisis of 2007–2008 can be understood in this way too – not least, as a construction. To understand the present crisis, Brian Holmes has traced cycles of capitalist growth and the depressions that punctuate them by also referring to long wave theory. Rather than Mandel, he refers directly to the Russian economist Nikolai Kondratiev, who identified three long waves of growth underpinned by techno-economic paradigms: 'rising from 1789 to a peak around 1814, then declining until 1848; rising again to a peak around 1873, then declining until 1896; and rising once more to a peak around 1920

(followed by a sharp fall, as we know, in 1929)' (Holmes 2013, 204). What Kondratiev discovered was that large numbers of technological inventions are made during the slumps, but only applied during the upsurges. Holmes explains: 'Investment in technology is suspended during the crisis, while new inventions accumulate. Then, when conditions are right, available capital is sunk into the most promising innovations, and a new long wave can be launched' (2013, 206).

Recognition of this cyclic pattern of renewal has become hugely influential in capitalist economics, for instance in informing Joseph Schumpeter's idea of how innovations revolutionize business practices – what he calls 'creative destruction', which is later morphed into 'disruption innovation' (associated with Clayton Christiansen and the Harvard Business School of the mid-1990s) – to demonstrate how profit can be generated from stagnated markets. In this neoliberal appropriation of Marxist economic theory (where inherent destruction becomes creative), we can also see how history continues to repeat itself in perverse ways. Is something similar taking place with digital technology at this point in time following the dotcom hype and its collapse? Is the pastiche-driven retrograde style of much cultural production an indication of business logic that seeks to capitalize on the present crisis before launching new innovations on the market? Yet, before making such a bold assertion, we should also be wary of other determinisms, as the relays of technological innovation alone do not reveal the inner mechanisms of the broken economy, but broader analyses that reach beyond technology. Like 'too much world', Holmes reminds us of the link between the mode of production and the social relations that arise from this: 'Technology has as much to do with labour repression as it does with wealth and progress. This is our reality today: there is too much production, but it is unaffordable, inaccessible, and useless for those who need it most' (Holmes 2013, 209). A rather depressing reality is postproduced.

This position seems to concur with the overall problem of endless growth and collapse – the reification of class divisions – where old technologies are repackaged, but in ways that serve to repress historical conditions rather than repurpose them. In a similar vein, like Benjamin, Jameson would have us conceive of the contemporary phase of capitalism in dialectical terms of both catastrophe and progress (Jameson 1991, 47). This means to inscribe the possibility of change into the very model of change offered up as unchangeable – or something similarly paradoxical. Other kinds of innovations outside the capitalist market might be imagined in this way, but there also seems to be a problem here, in that these processes are soon absorbed back into further stages of social repression. Does the post-digital encapsulate such a reality?

What becomes clear is that neither modern nor postmodern discourses are sufficient to grasp the characteristic features of the historical present. Instead, Osborne would insist that we are increasingly subject to the conditions of 'global contemporaneity' (2010). And the term 'contemporary' becomes useful inasmuch as it does not simply represent a historical period per se, but, rather, a moment in which shared issues that hold a certain currency are negotiated and expanded. Beyond simply suggesting that something is new or sufficiently different (post-something), the contemporary poses the question of when the present of a particular object begins and ends.

* * *

But are these various periodizations simply too mechanistic, too economically determining? Indeed, are Marxist theories of capitalist crisis – bound as they are to the development of the forces of production in order to conceptualize decisive (class) action – rather outmoded? Building on Marx's well-known assertion that 'humans do not make their own history as such but under circumstances existing already, given and transmitted from the past', it is generally considered far too deterministic these days to believe that the historical subject is ready for action once called upon by history; and that, once self-recognition of conditions or class consciousness is attained, they will take the right course of action (the Hegelian passage from in-itself to for-itself). Rather, historical processes are today generally understood as phenomena that are analogous to the workings of wider complex systems, in expressing ongoing processes of development and complexity, beyond the reach of a linear narrative of progress or the straightforward accumulation of knowledge.

This is where it becomes important to conceptualize history in ways that are less human-centred (or that rely on a coherent human subject) and where historical materials can be understood in ways that the human sensory apparatus cannot comprehend directly. This presents new ways of understanding and acting in the world, exceeding what is seeable, readable and knowable, that change the way we conceptualize history. The concept of 'microtemporality' developed in the work of Wolfgang Ernst offers a time-critical analysis for understanding this non-human aspect – using methods that are further explained as 'epistemological reverse engineering' to the point where 'media' (and not just humans) become active archaeologists of knowledge (Ernst 2011, 239). From this perspective, the cultural lifespan of a technical object is not the same as its operational lifespan (as, for instance, in the way a radio receives an analogue signal), and there is a 'media-archaeological short circuit between otherwise historically clearly separated times' (Ernst 2011, 240). Ernst's contention is that there is not necessarily a historical difference between a technical object's functional technical operation in the past and now. The claim is that, rather than being bound to anthropomorphic narratives like history, alternatives can be posed that hold the potential for 'an almost ahistorical functional reenactment' (Ernst 2013, 175). Re-enactment can operate as a time machine that activates an experience of media-time in contrast to the historicist notion of time.

In this way, a Foucauldian 'archaeology of knowledge' is purged of its anthropomorphism as Ernst put it, and analysis is extended beyond the human sensory apparatus to the non-discursive realm of technical infrastructures and computer programs. Ernst's example is 'Fourier analysis', in which the machine performs a better cultural analysis than the human is capable of. For instance, in signal processing (audio, radio waves, light waves, seismic waves, and even images), Fourier analysis can isolate individual components of a compound waveform, concentrating them for easier detection or removal. To Ernst, '[o]nly by the application of such medial-technological tools can we explain the microtemporal level of such events' (2011, 245).

However, and importantly, these tools or programs need to be operative in order to be 'radically present'. This is particular to technical objects that need to remain functional, based on the understanding that the 'computer does not reveal its essence by monumentally being there but only when being processed by [...] calculating processes' (2011, 241). The computer is temporal in its internal structure. A simple example from programming would be the sleep function, inasmuch as the program does not really sleep but waits for another process to finish or simply slows a program down for efficiency. When a program sleeps for a certain amount of time, it has to keep working to make sure that it wakes up at the right time. In other words, technical objects are considered to be less historical and more processual, no longer simply bound to the 'macrotemporal processes' of history but to 'microprocessual timing', or machine time.

In programming, to give a further example, system time represents a computer system's notion of the passing of time measured by a system clock, which is typically implemented as a simple count of the number of ticks that have transpired since some arbitrary starting date, called the 'epoch'. System time can be converted into calendar time, which is a form more suitable for human comprehension, but they are not reducible to one another. For example, the Unix system time in seconds since the beginning of the epoch translates into calendar time that is decidedly different. The simple UNIX command that draws on system time follows:

```
Last login: Wed June 14 06:39:32 on console
D05538:~imvgc$ date "+%Y-%m-%d %H:%M:%S"
2014-06-14 14:10:41
```

Machine time clearly operates at a different register. Although the general argument that time is now also organized technologically seems indisputable, there are some issues that relate to a politics of time that runs the risk of being determining in other directions. Clearly, computational processes execute a very particular view of history, and the operations of memory and storage are key to this. In solving a given problem, the central processor takes symbols from memory, combines or compares them with other symbols, and then restores them to memory. Memory here refers to random-access memory (RAM), whereby programs are created, loaded and run in temporary storage in real time. Whether these are written to hard memory becomes an intriguing analogy for the ways in which memory is loaded into history (and how this process is ideological in terms of what becomes official history) and how data is selected, stored, processed and also deleted in all systems.

To be clear, Ernst does not simply reject history, but wishes to develop a different emphasis on microtemporality – one that he considers to be a relative blind spot in media analysis. The case of the phonograph, for example, opens up other sonic registers beyond music, such as noise, and in so doing registers 'nonmusical articulations' and what Ernst calls 'informative surplus' (2013, 174). Recording technologies such as this are recognized to be historical in a general sense, of course – in terms of their technical and discursive context – but also the 'mechanism itself is able to sustain an island of non historical eventuality' (2013, 182). As such, the human sensory apparatus is considered inadequate for the recording of cultural memory, and acoustic archaeology requires media to assist. This is what he calls the '"media archaeological ear" that listens to the sound of material tradition, in fact the technically mediated *sonic* processuality of what is otherwise called history' (2013, 181).

But what is really meant by the historical in this respect, and why does it continue to matter? Again I would point to Osborne's close attention to the 'structure of temporalization (the *historically* new) which inscribes the spatial logic of social differences into a totalization of historical time' (1995, 198). It is here that the question of possibility, or should we simply say politics, arises. Osborne thinks that politics necessarily involves struggles over the experience of time, to both enable and disable various possibilities for change. We might ask what further lines of possibility for change are enabled and disabled by the emphasis on microtemporality.

* * *

Rather than run the risk of overlooking the potential of the macrotemporality of history in favour of the microtemporality, why not deepen the contradictions between them? In Ernst's work, contradiction is addressed to some extent in his emphasis on contingency in stochastic mathematics (in probability theory, a stochastic process is a collection of random values), and also in the recognition that there is an indeterminism between human and non-human knowledge that comes close to the uncertainty principle. (The uncertainty principle asserts that no thing has a definite position, a definite trajectory, or a definite momentum, and that the more an attempt is made to define an object's precise position, the less precisely can one

say what its momentum is (and vice versa).) Indeed, physics, or quantum physics, provides verification that history is knowable and unknowable at the same time, and hence indeterminate. Ernst puts it this way:

> Once human senses are coupled with technological settings, man is an autopoietic temporal field, a chrono-regime of its own dynamics (or mathematics, when data are registered digitally). Such couplings create moments of exception: man is taken out of the man-made cultural world (Giambattista Vico's definition of 'history') and confronts naked physics.
>
> (2013, 177)

Even Hegel's apparent teleology culminating in the end of history is arguably predicated on contingency. The passage from in-itself to for-itself can be understood as a developmental process in which consciousness of conditions is derived recursively, generating a consciousness of consciousness (echoing one of the principles of second-order cybernetics). What appears is not true knowledge as such (at the end of history) but what appears to be known, adding another level of consciousness, and so on, in an ongoing iterative process with contradiction present at all levels. An understanding of adaptive systems informs this interpretation, which undermines accusations of a deterministic understanding of history (associated with Hegel and aspects of Marx), making it far more recursive – and closer to a media archaeological notion of 'recursive history' than might have been initially expected.

It is the temporal sense of incompleteness that drives transformative agency, and the ways in which human subjects seek to modify their lived circumstances knowing their experiences to be incomplete. In other words, there is not just a short circuit between otherwise historically clearly separated times, but also feedback loops that describe the way the historical subject opens up possibilities to modify and self-organize. This is in keeping with the claim that machines need to function in order to be 'radically present' – they know their place in history as other 'workers' arguably do. (Mladen Dolar's rereading of von Kempelen's automata in Hegelian terms is relevant here: as a move from a machine in-itself (the speaking machine) to for-itself (the thinking machine) (2006).) If the tools or programs need to be operative in order to be radically present, then this goes for humans too.

The complexity of historical temporality (and constitution of machinic subjectivities) requires further elaboration if one is to hold on to any possibility of transformation (see Berry 2015, this volume). Time is undoubtedly organized technologically, but under the circumstances of existing cultural–historical–computational conditions. Concentrating efforts on understanding temporality at both micro and macro levels begins to unfold more complex and layered problems of different kinds of time existing

simultaneously across different geopolitical contexts. Thus, the historical present

> is a conflicted social process of identification, interrogation and disavowal – recognition and misrecognition – of extraordinary complexity, which requires the constant production of new pasts to maintain its rhythm of temporal negation and projection, as urgently as new images of the future.
>
> (Osborne 1995, 199)

The importance of this is that social forms of subjectivity are bound to politics as a dynamic force through which change can happen. This is why Osborne thinks that politics necessarily involves struggles over the experience of time, to both enable and disable various possibilities for change and action. Does this not emphasize the problem of simply declaring something as being 'post' something else? When it comes to the condition of the post-digital, the issue of temporality seems underdeveloped, to say the least.

References

An earlier shorter version of this text entitled 'Prehistories of the Post-digital: or, some old problems with post-anything' appeared in the online journal *A Peer-Reviewed Journal About Post-Digital Research*, 3(1), February 2014. http://www.aprja.net/?p=1314, date accessed Jan 2015.

Benjamin, W. (2003) On the Concept of History, in Eiland, H. and Jennings, M. W. (eds.) *Selected Writings, Vol. 4, 1938–1940*. Cambridge, MA: Belknap Press. 389–400.

Berry, D. M. (2015) The Postdigital Constellation, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 44–57.

Cascone, K. (2000) The Aesthetics of Failure: Post-Digital Tendencies in Contemporary Computer Music, *Computer Music Journal* 24(4): 12–18.

Chun, W. K. C. (2015) Networks NOW: Belated Too Early, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 290–316.

Cramer, F. (2013) Post-Digital Aesthetics. http://lemagazine.jeudepaume.org/2013/05/florian-cramer-post-digital-aesthetics/, date accessed Jan 2015.

Cramer, F. (2015) What Is Post Digital?, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 12–28.

Dolar, M. (2006) *A Voice and Nothing More*. Cambridge, MA: MIT Press.

Ernst, W. (2011) Media Archaeography: Method and Machine versus History and Narrative of Media, in Hutamo, E. and Parikka, J. (eds.) *Media Archaeology: Approaches, Applications and Implications*. Berkeley, CA: University of California Press. 239–255.

Ernst, W. (2013) Toward a Media Archaeology of Sonic Articulations, in Parikka, J. (ed.) *Digital Memory and the Archive*, Electronic Mediations No. 39. Minneapolis: University of Minnesota Press. 172–183.

Foster, H. (2002) *The Anti-Aesthetic: Essays on Postmodern Culture*. New York: The New Press.

Holmes, B. (2013) Crisis Theory for Complex Societies, in Bazzichelli, T. and Cox, G. (eds.) *Disrupting Business*. New York: Autonomedia. 199–225.
Jameson, F. (1991) *Postmodernism, or, The Cultural Logic of Late Capitalism*. London: Verso.
Kojève, A. (1947) *Introduction à la lecture de Hegel: Leçons sur 'La Phénoménologie de l'Esprit.'* Paris: Gallimard.
Mandel, E. (1972) *Late Capitalism*. London: Verso.
Osborne, P. (1995) *The Politics of Time: Modernity and Avant-Garde*. London: Verso.
Osborne, P. (2010) *Contemporary Art Is Post-Conceptual Art/L'arte contemporanea è arte Post-concettuale*. Public Lecture, Fondazione Antonio Ratti, Villa Sucota, Como. http://www.fondazioneratti.org/mat/mostre/Contemporary%20art%20is%20post-conceptual%20art%20/Leggi%20il%20testo%20della%20conferenza%20di%20Peter%20Osborne%20in%20PDF.pdf, date accessed Jan 2015.
Osborne, P. (2012) Contemporaneity and Crisis: Reflections on the Temporalities of Social Change. Lecture at CUNY Graduate Center. http://globalization.gc.cuny.edu/2012/11/videopodcast-peter-osborne-on-contemporaneity-and-crisis/, date accessed Jan 2015.
Osborne, P. (2012–2013) Temporalization as Transcendental Aesthetics: Avant-Garde, Modern, Contemporary, *The Nordic Journal of Aesthetics* 23(44–45): 28–49.
Parikka, J. (2015) The City and The City: London 2012 Visual (Un)Commons, in Berry, D. M. and Dieter, M. (eds.) *Postdigital Aesthetics: Art, Computation and Design*. Basingstoke: Palgrave Macmillan, pp. 203–228.
Steyerl, H. (2013) Too Much World: Is the Internet Dead?, in *e-flux*. http://www.e-flux.com/journal/too-much-world-is-the-internet-dead, date accessed Jan 2015.

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Dark Patterns: Interface Design, Augmentation and Crisis

Michael Dieter

In early 1951, Douglas Engelbart – a young and idealistic electrical engineer working odd jobs for research laboratories in California – was suddenly taken by an unexpected series of epiphanies. Having spent time working on radar equipment during World War II and now contemplating how to make a significant contribution to society with his career, 'the most difference for improving the lot of the human race' (1986, 188), Engelbart considered the increasing complexity and urgency of global problems. His assessment involved an essential rationale – that for any given problem, the product of its complexity multiplied by its urgency would provide a measure of the immense difficulty that humanity would face in developing solutions. This led to a succession of rapid illuminations:

> FLASH-1: The difficulty of mankind's problems was increasing at a greater rate than our ability to cope. (We are in trouble.)
>
> FLASH-2: Boosting mankind's ability to deal with complex, urgent problems would be an attractive candidate as an arena in which a young person might try to 'make the most difference.' (Yes, but there's that question of what does the young electrical engineer do about it? Retread for a role as educator, research psychologist, legislator, ...? Is there any handle there that an electrical engineer could ...?)
>
> FLASH-3: Ahah – graphic vision surges forth of me sitting at a large CRT console working in ways that are rapidly evolving in front of my eyes (beginning from memories of the radar-screen consoles I used to service).
>
> (Engelbart 1986, 186)

Formulated into a hypothesis based on recollections of wartime, Engelbart's intuitions for new media were projected through the image of cathode rays and calculative graphics. As a thoroughly mediatized vision, and one already caught up with an awareness of epistemic crisis, his revelations informed