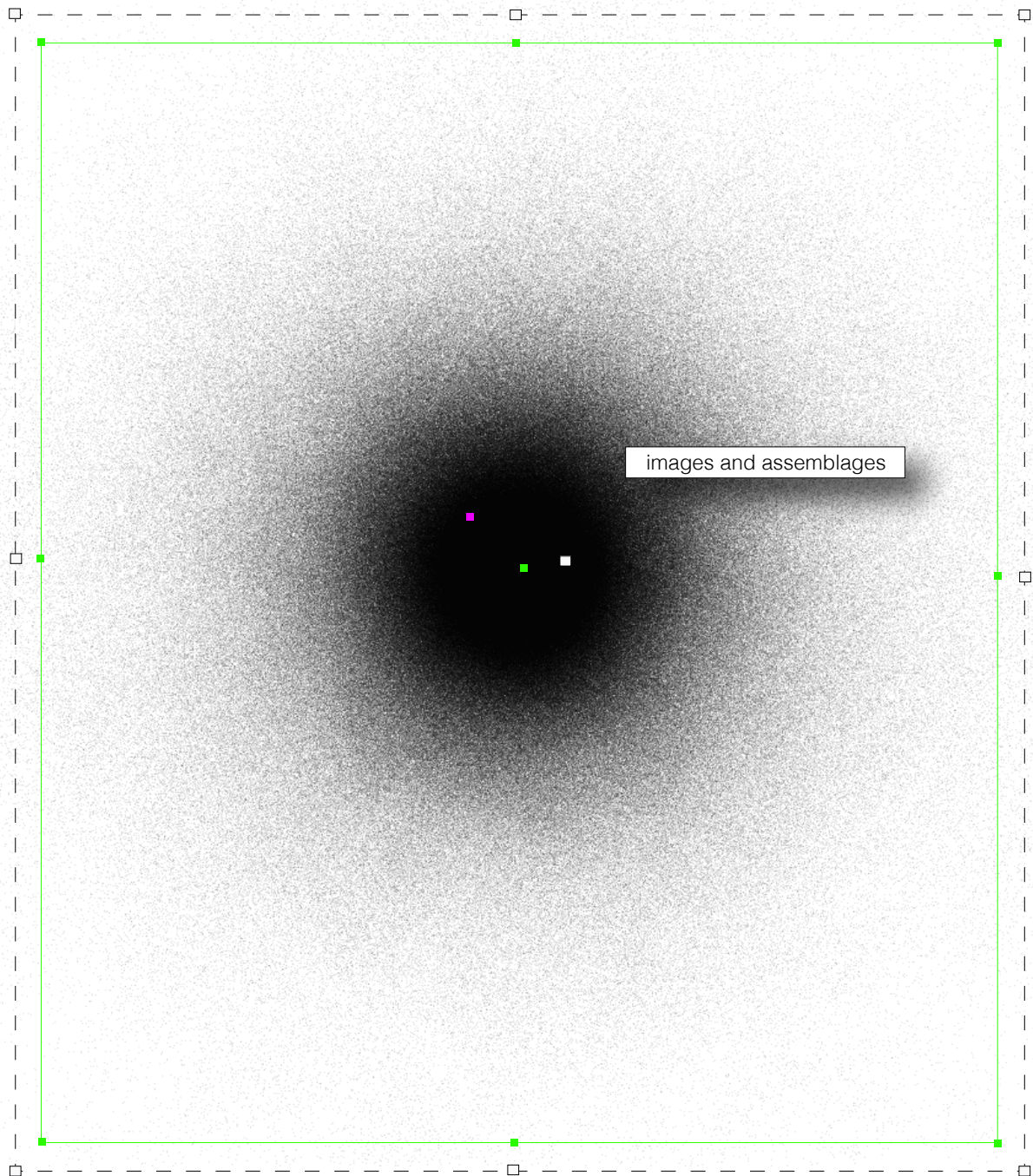


# The Fibreculture Journal

DIGITAL MEDIA + NETWORKS + TRANSDISCIPLINARY CRITIQUE



Issue 24 : 2014

Images and Assemblages

edited by Su Ballard



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## About the Fibreculture Journal

The Fibreculture Journal is a peer reviewed international journal, first published in 2003 to explore the issues and ideas of concern to the Fibreculture network.

The Fibreculture Journal now serves wider social formations across the international community of those thinking critically about, and working with, contemporary digital and networked media.

The Fibreculture Journal has an international Editorial Board and Committee.

In 2008, the Fibreculture Journal became a part of the Open Humanities Press , a key initiative in the development of the Open Access journal community.

In 2012 the Fibreculture Journal celebrated ten years of open access scholarly publishing with the publication of its 20th Issue.

The journal encourages critical and speculative interventions in the debate and discussions concerning a wide range of topics of interest. These include the social and cultural contexts, philosophy and politics of contemporary media technologies and events, with a special emphasis on the ongoing social, technical and conceptual transitions involved. More specific topics of interest might include:

- :: informational logics and codes
- :: the possibilities of socio-technical invention and sustainability
- :: the transdisciplinary impacts of new media technologies and events in fields such as education, the biosciences, publishing or knowledge management
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- :: national and international strategies for innovation, research and development
- :: contemporary media arts
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- :: software and hardware develops in relation to the social
- :: networks :: media change, convergence and divergence
- :: the use of contemporary media in socio-technical interventions

The Fibreculture Journal encourages submissions that extend research into critical and investigative networked theories, knowledges and practices.

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## The Fibreculture Journal: Issue 24 Images and Assemblages 2015

Editorial 1

Su Ballard  
University of Wollongong, Australia.

### Articles:

FCJ-173 Being and Media:  
digital ontology after the event of the end of media. 6

Justin Clemens  
University of Melbourne

Adam Nash  
RMIT University

FCJ-174 Constructing the contemporary via digital cultural heritage. 33

Torsten Andreasen  
University of Copenhagen

FCJ-175 Humans at play in the Anthropocene. 59

Troy Innocent  
Swinburne University of Technology

FCJ-176 A Skeuomorphic Cinema:  
Film Form, Content and Criticism in the 'Post-Analogue' Era. 81

David H. Fleming  
University of Nottingham Ningbo China.

William Brown  
University of Roehampton, London.

---

FCJ-177 Television Assemblages.

106

Teresa Rizzo  
University of Sydney

FCJ-178 Network Affordances:

The unpredictable parameters of a Hong Kong SPEED SHOW.

127

Audrey Samson  
City University of Hong Kong

Winnie Soon  
Aarhus University



## issue 24 : Images and Assemblages 2015

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### Editorial:

Su Ballard  
University of Wollongong

### Possible worlds

It is worth paying attention to images. Picture opening the pages of a neglected book and finding an image of some bland nineteenth century industrial dreamscape with a small black smudge in the bottom left corner. Clues to the future of the world can be found in this microcosm; a sooty mark left by over-heated carbon as it drifted down to the surface of the page. Impossible to erase from either the page or the history of its own making the soot is a terrible troublemaker; together with the humans who learnt to manufacture it, it is a locus of anxiety and concern. In looking closely at this small sketch I find documentation of the transformations of the biosphere; mundane media twisted into a networked and sustaining dialogue that points towards something of the possible world to come.

Even with their backs turned, images continue to have something to say. Their presence is palpable in YouTube clips documenting the wreckage of seventh century Assyrian artifacts at Mosel, and Facebook feeds trying to incite action over the Australian government's sanctioning of mining of the Burrup Peninsula. The presence of wreckage generates new understandings of the relationship between images and humans. In their destruction sites such as these find themselves reconfigured. They become social and cultural assemblages or, what Torsten Andreasen, in this issue, calls "unintentional monuments." Amidst a political world dedicated to the oscillation between obscene crimes and headline grabbing models of excellence, unintentional monuments are images holding on as quiet assemblages of hope and possibility.



Just like those tiny particles of soot that I probably should have noticed earlier, the unintentional monument is trying to tell us something. What these images want us to know might be found at the limit edge of these assembled monuments. The question is how to track them amidst such violence. And, is there such a thing as a degree zero; an image that can stand up as the defining unintentional monument of the early twenty-first century?

If inciting attacks by humans wielding large machinery is the marker of a shared or defining border, then one contender must be Michael Mann's "hockey stick" graph. Named "MBH99" and labeled by Scientific American an "iconic symbol of humanity's contribution to global warming", the hockey stick has been brutally threatened since its prominent inclusion in the summary documents of the IPCC in 2001. The "hockey stick" is an image of information and biology together, documenting both the acceleration and limits of growth. More than this, the hockey stick is a critical material assemblage formed from tree rings, ice cores, lake sediment and coral. It is an image that has stood up for itself in the face of relentless attack.

It's not all bread and roses. In a time of great toxicity what we should and shouldn't touch with our hammers is increasingly difficult to monitor. So-called media images appear to be out of control, others, like the hockey stick, remain full of possibility. Nietzsche advocated that we sound our idols, touching them with both a hammer and a tuning fork. And this issue is such a call for attention. It is false to draw too many connections between the essays, but the process of editing an issue means that there is an inevitable generation of an assemblage both mutually translating and networked. In resonating the space of images, in locating unintentional monuments, these essays suggest that we can discover some new strategies for being in and understanding the world today.

Each of the essays gathered here in this second general issue seek to address the question of the image by challenging both what the 'image' might be and also by thinking the limits at which images assemble. Rather than demanding (or necessarily offering) succinct answers, these essays map movements between and across media, catching key moments where images turn away from us and dissolve into unsettling assemblages of substance, network, event, utterance, and play.

A number of unintentional monuments appear. In addressing our shifting viewing habits, Teresa Rizzo maps the demise of the VHS recorder. Like magnetic tape, its friend in media, the VHS is mourned by a few humans harboring nostalgia for the disappearance of species. No longer considered an active member of the consumer household, the videotape finds shelter in thrift store back alleys. Likewise, in the edges of their essay, Audrey Samson and

Winnie Soon document the future demise of the Internet café. As thinning wires struggle to conduct and distribute ever increasing quantities of data it seems that mobility has rendered the anticipatory banks of computer terminals redundant.

Justin Clemens and Adam Nash debate the right of the image assemblage to exist at all. Observing the constant modulations of storage and display, representation and presentation that occur within digital realms, they call for a radical reorganization of the categories of media via an argument for digital ontology. Highlighting mediation as a relationship of amplification, and drawing on relationships between environment, thought and experience, they argue that we find ourselves “not in a media situation, but in a simulated-media situation.” If “the age of media is over” they say, digital media must be a state of mind rather than a thing. The importance of modulation to experience also becomes something more than the trace of oscillating data packets, more than a world of constant and incessant ‘connectivity’. It seems that more than media binds humans to their data machines.

Torsten Andreassen demonstrates the control of the image assemblage via its history and offers a reading of how culture is constructed via heritage. Key to the analysis is an identification of culture as a “goal” rather than something preexistent. Addressing digital cultural heritage is not a process of identifying how we preserve culture, (safeguarding the monument) but how we enable access. In the utopian rhetoric of UNESCO Andreassen finds a worldview that builds a digital cultural heritage with only beneficial consequences; a place in which “the temporary conjunction of global cultural heritage operates as if this totality were an actual empirical entity.” More questions are raised: where are the material limits of this global present? And, how does humanity encounter itself? Different postcolonial temporalities suggest that these questions mask an urgent geopolitical task: the formation of the contemporary.

Like Nash and Clemens, Andreassen highlights the impossibility of defining digital things, and the necessity of questioning the tools that have constructed media in the first place. The challenge is how we experience the contemporary, with its asynchronous constructions of culture and time, as an archaeological experience that is current yet reflective of the constructions of culture. One approach might be found in games and play.

Troy Innocent takes the image assemblage to the street. The city in Innocent’s world is a dissolving image. Forming and reforming anything we momentarily recognize as a city is no longer solely the realm of the *détournement*, nor the transitory routes of the *dérive*. Innocent shows how it is play that is the key to understanding the city as an

image assemblage of differing dynamics and behaviours. Innocent presents a manifesto for play as a productive enabling force that can challenge the unstable zone of the city. He shows how the local, shared, small scale and resourceful approach of the micronation maps one response to the problems of the human in the context of the Anthropocene. Innocent introduces us to the micronation of Ludea — a nation of play integrated within and questioning the parameters of the city. Ludea makes mixed realities and cross media ecologies tangible. In enabling the journey through the city via mixed reality gaming, and the generation of micronations, Innocent reminds us that play has always been a key strategy for being, survival and existence.

David Fleming and William Brown show us how the image assemblage forms and reforms in patterns. Images form between materials and their medium. None more so that in the environment of cinema. Fleming and Brown argue for the inadequacy of existing frameworks for digital cinema, remediated or not. Beginning with a material history of film that demonstrates how ‘new’ media retain the design features of earlier media, they turn to the gaseous notion of the skeuomorph to demonstrate that it is possible to see the past and future of cinema simultaneously. In its languages and materials cinema refuses to drop its own histories, yet forever proclaims its own novelty. With a focus on the cinematic mainstream of the Hollywood blockbuster, and a case study of James Cameron’s ‘swing-cam’ in *Avatar*, they show that the challenge of the new is both simulated and replicated within digital cinema. In these Hollywood movies, we do not expect to see cinema at the cinema, and no one these days anticipates reality, but somehow our referent remains something that appears convincingly ‘cinematic’.

Teresa Rizzo shows how audience engagement with the image assemblage is shifting the site of control. In her essay ‘Television Assemblages’ Rizzo demonstrates how television and television culture are reconfigurable. The assemblage she turns to is the cultural and social viewing body that shares its spaces with digital multi platform television. She writes: “A highly stratified assemblage, broadcast television offers viewers very few opportunities to actively participate in the media texts that they are directed to consume.” Now the smooth space of interactivity is equally reinforced and challenged. No longer funneled through the broadcast pipe, television is just one part of an open and dynamic system. Rizzo traces the associations between objects as they shift and reform into social images. Importantly, she also turns to the particular viewing habits of children and highlights an individualised model where the very relation between being and becoming is in constant modulation.

Audrey Samson and Winnie Soon watch the image assemblage through the material affordances of the network. In their essay “Network Affordances: The unpredictable parameters of a Hong Kong SPEED SHOW” Samson and Soon expand the concept of

affordance to include the unpredictable and material determinants of the network. Against a background of the development of material networks across Hong Kong and within an environment where both art and capital are viewed as trading commodities, Samson and Soon document the staging of SPEED SHOW[2.0] in a local internet café. Countering the commercial desire that facilitates physical networks Samson and Soon open up possibilities for non-commercial activity via art works that highlight the material relations of the network. The extension of affordance as a mode to understand material relations across the network is significant here, as Samson and Soon highlight how previous discussions of affordance have skimmed over the centrality of unpredictability in computational networks. In this understanding, code and the dynamics of network distribution become unpredictable collaborators in the presentation of the image.

It is this unpredictable, networked, yet resolutely material space of the image that twists itself back through all the essays. Cutting across diverse concerns, the essays demonstrate the challenge of thinking both with and without the image in networked culture. Each of the essays offer us starkly different ways of presenting, distributing, questioning, and making images. What images want is perhaps answered here: that in a possible world the predictability and unpredictability of material things is extended to ecological and computational parameters.

## FCJ-173 Being and Media: Digital ontology after the event of the end of media

Justin Clemens  
University of Melbourne

Adam Nash  
RMIT University

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### Abstract:

In the contemporary era, everything is digital and the digital is everything. Everything is digitized to data, then modulated between storage and display in an endless network of protocol-based negotiation that both severs any link to the data's semantic source and creates an ever-growing excess of data weirdly related to, but ontologically distinct from, its originating data source. Since the very 'concept of medium' means that there are media, plural, i.e., differentiated media, and since the digital converges all media into a single state (that is to say, digital data), then by definition the concept of media disappears. Instead of media, there are simulations of media. This is the 'event' that needs to be thought through. In this paper, we construct an ontology appropriate to the era of digital networks and draw out several consequences for the relationship between humans and digital networks.

*Everything is Digital*

Today, everything is digital and the digital is everything.

Surely such a totalising, yet reductive, assertion can't be right, even if we accepted that it had any sense? What about rocks and stones and trees? The great eighteenth-century literary critic Dr Johnson famously responded to Bishop Berkeley's idealist, 'immaterialist' philosophy broached in *A Treatise Concerning Human Understanding* by kicking a boulder and declaring "I refute it thus!" (Boswell, 238). Such a naturalist rejoinder has found its contemporary avatars in the field of media studies under a variety of names, ranging from Bruno Latour and Actor-Network-Theory [1] to Luciano Floridi's philosophy of information (Latour, 2007; Floridi, 2014). Despite their manifest, manifold differences, what unites such projects is their commitment to fundamentally naturalistic redescrptions of the complex interactions of trans-human agents. They are directed at displacing 'the human' from the centre of action, multiplying the sites and forces and functions that are to be analysed, at the same time that these factors are simultaneously treated as part of a sole and single natural world. For such redescrptions, then, the grand assertion with which we began not only fails basic evidentiary testing, but lacks any real pragmatic or intellectual interest; at best, such assertions would be precisely symptoms of an outmoded or misguided approach.

Something similar would go for those who attend to the new technologies of our time from a social, historical and political perspective. 'History,' under this description, is considered as a non-teleological temporal becoming ruled by contingencies: whatever happens might also not have happened; yet what happens also happens as a result of human intentions and actions; finally, it is with respect to the consequences for the latter that what happens comes to matter at all. Insofar as this is the case, it is the task of scholars to attend to the complex local and temporal interactions of the heterogeneous sites, expertise, interests and acts that have led to the development, say, of the microprocessor or HTTP or Web 2.0. What is now widely called 'software studies' would be exemplary in this regard (although it is not of course the only way of attending to media under this general rubric). The very title of 'Chapter 1' of Adrian Mackenzie's *Transductions* (2002) summarises the fundamental axioms of this approach directly: "Radical contingency and the materialisations of technology." [2] Similarly, Lev Manovich attends to the multiple forces driving new media developments in a socio-political frame; in doing so, he necessarily points to the impact upon the means and vocabulary with which we attend to the new phenomena. "[T]hese very terms," Manovich writes, "content, cultural object, cultural production, and cultural

consumption—are redefined by web 2.0 practices” (2009, 326). Or, as he puts it in another text, software studies “has to investigate the role of software in contemporary culture, and the cultural and social forces that are shaping the development of software itself” (Manovich, 2013: 10). For such accounts, then, there can also be no fundamental interest in big ontological claims. Rather, there is a commitment to minutely tracking developmental processes that are integrally mediated through the human, along with their social and political implications. Ontology, when it enters at all, can only do so as an historically-circumscribed concern.

Yet there is another field—that of contemporary speculative philosophy—which, given it should in principle immediately take an interest in grand ontological assertions as they pertain to the digital, nonetheless has shown few signs of doing so with the requisite attention or detail. The ‘return to ontology’ reignited by Alain Badiou’s *Being and Event* in 1988 (English translation 2004) has seen the emergence in the 2000s of a project broadly denominated as ‘speculative realism,’ and whose major representatives include Ray Brassier, Graham Harman and Quentin Meillassoux. [3] What broadly characterises this trend is its commitment to a return to a full-blown metaphysics of ‘being,’ outside of any subjective or human ‘correlation.’ Perhaps the best-known tributary of this movement is ‘object oriented ontology’ (OOO), expressly named as such by Harman on the model of ‘object oriented programming’—but just as expressly without any further relation to computing than that. What is certainly notable about all these ontologies is their radicalisation of what Martin Heidegger (1996) phrased ‘the ontico-ontological difference’: that is, the difference between ‘beings’ and ‘being.’ For Heidegger, this distinction had been constitutionally forgotten by Western metaphysics, such that metaphysics came to consider being itself as one being among others, albeit as the highest or supreme kind of being (such as ‘God’ in Christian theology)—to the point where the very forgetting had itself been forgotten. To escape metaphysical encapsulation, then, Heidegger attempted by a variety of means to reinvigorate the ontological difference; he found that he had to abandon received uses of predication and description as the appropriate means of doing so. In their place, he began to offer an extraordinary meta-theory that can itself be seen as a radical form of media theory, that is, by way of a return to language as the opening of any possible revelation (“language is the house of being”), and with poetry as its privileged witness in our destitute times, governed as they are by modern technology (Heidegger, 2000: 83). Despite their own difficulties with Heidegger, the speculative realists share his anti-descriptivist rage in their constructions of systems of real objects utterly indifferent to any human concerns. In doing so, however, they are also concerned to attend to the abstract problematics of transmission, that is, of ‘media’ in the most rigorous way.

It is noteworthy that these three major trajectories (the naturalist, the socio-historical and



the object-oriented-ontological) in contemporary media studies are incommensurable, if in perhaps unexpected ways. First, the naturalists and sociologists share a descriptivist approach, although they differ strenuously on the place that they assign to the human; the naturalists and ontologists share a hostility to the human, but differ strenuously regarding the status of description; the sociologists can only take up the ontologists as a supplement, whereas the reverse does not hold; the ontologists, ironically, fail entirely to think of or about the actual status of the new media upon which they are nonetheless clearly dependent, except by recourse to sociological or naturalistic motifs which then undermine (or even overmine) the ontology.

Certainly, we have characterised these trajectories both briefly and broadly, as a form of what Max Weber might have called ‘ideal types.’ In fact, many of the studies we invoked above are more hybrid in practice, mixing and matching elements according to situational and pragmatic demands. Yet this hybridity hardly vitiates the tension between the trajectories, which, as we have indicated, is irreducible; this tension leads to certain opacities or blind-spots regarding the status of media for each trajectory, which the others can supply only at the cost of their own blindness. Indeed, hybrid practices themselves tend to obscure the consequences and real stakes of the incommensurability insofar as it cannot simply be a matter of picking-and-choosing from each; such an option repeats rather than resolves the difficulties. What we propose in this paper, then, is to use elements from each of these tendencies in a way that none of them can do alone; in doing so, we will construct a specifically digital ontology which, while tied in an integral way to the new media of our times, also exceeds their current forms; this construction will enable us to show that the modalities of differentiation in new media do not only occur at the level of display, nor at the level of programming, but in a genuinely ontological way. This ontology will be at once historicist, inhuman, and anti-descriptivist. It will be processual, multiple, and without objects. Yet it will be able to account for the genesis and transmission of all sorts of digital entities. It will, finally, have a probative value in that it is able to reassign some of the descriptive claims that seem to be made about media as moments of different levels of different kinds of operations upon being.

## Digital ontology is the event of the end of media

For anything to appear in the digital realm—here, in the usual acception of ‘digital media’—it must first be digitised to data, then modulated between storage and display in an endless protocol-based negotiation that both severs any link to the data’s semantic source and creates an ever-growing excess of data weirdly related to, but ontologically distinct from, its originating data source. This distinction between digital data and its display has been

investigated by many contemporary thinkers, often in a manner indebted to the Platonic concepts of ‘amamnesia’ and ‘hypomnesia.’ The German ‘post-media’ scholar Friedrich Kittler famously relies on this split to assert that there are no longer any media, saying, “with numbers, everything goes [...] a digital base will erase the very concept of medium” (Kittler, 1999: 34). Since the very concept of media by definition presumes that there are media, plural (for example, differentiated media), and since the digital converges all media into a single state (that is to say digital data), then by definition the concept of media simply disappears. In other words, data is the Great Leveler. There still seem to be media in the world, because this plastic data state is eminently able to be modulated into arbitrary display states, but these states are now rather a simulation of media. This is not to say that data is itself simply undifferentiated, only that its essentially modulable plasticity cannot be considered under the received rubrics of formal or predicative differences. To the contrary, as we explain further below, it will be necessary to reconsider differences themselves on the basis of a radicalised understanding of the digital base. Kittler’s argument is directed towards the concept of media as intervening agencies or materials that must precisely be differentiated from each other to be considered as media. Because digitisation places the emphasis on a plurality of modulations of the same material, just as Spinoza conceives of a single substance expressed in an infinity of modes, these modulations are no longer media in any traditional sense. One indication of this, as many commentators have underlined, is that even quite ordinary uses of digital media—one example being current social media—make it impossible to assign their operations to traditional categories of media studies. What is the ‘sender,’ ‘producer,’ ‘receiver,’ ‘message’ of a simple Facebook post? The digitisation process creates an excess of digital data through its own operations, an actual excess greater than the sum of just simple meta-media and the retroactive virtuality of the media being digitised as virtual content. Once modulated into a display state, the reconstituted data simulates media differentiation, and therefore can be analysed in terms of McLuhan’s nostalgic rear-view mirror (McLuhan and Fiore, 2001: 75). Indeed, Kittler acknowledges this (1999, 2). The point, however, remains: we are not in a media situation, but in a simulated-media situation. It is not that contemporary media saturate us with simulations, but that these media are themselves simulations. This is the ‘event’ that needs to be thought through.

## Data must be modulated

For, insofar as it is digitised or digitisable, there is no meaningful distinction between, say, an image and a sound, a video and a stock market price, until that data is once again modulated into a display register. Moreover, there is no necessary reason—ontological or otherwise—why any given set of digital data should be modulated into any given display state. Indeed, it is this contingency that founds the possibility of software studies. For

example, a digitised image need not be modulated into a visible display register as an image; instead, it could be modulated into figures populating a spreadsheet. It is a simple (relatively speaking) matter to construct a protocol that will ‘make sense’ of the data in the context of a spreadsheet, and such operations are regularly seen in the form of ‘information visualisation’ graphics (a highly fraught practice). [14] As stated above, the fact that there still seem to be media in the world, apparently differentiating themselves from each other, is entirely due to this protocol-driven modulation process to and from display states. This virtualisation of media in the digital represents the simultaneous apotheosis and demise of McLuhan’s prescient aphorism that the content of any new medium is all prior media (McLuhan and Fiore, 2001: 75). The age of media is over, for there is now only one medium; and one medium is no medium at all.

## Modulation as Simondonian Becoming

The English word modulate is derived from the Latin *modulari*, meaning to regulate. *Modulari* is itself derived from *modus*, meaning measure, rhythm, song or manner, and sometimes mood. The word first appeared in English in the 17th century in relation to music, where (then and now) it is a technical term meaning to change key during a performance or composition, and sometimes to change volume. It has come to denote a similar performative action in speech. The sense of regulated change into a different register, condition or form that is present in these usages of the word have allowed it to take on a broader meaning in general language, closer to its original Latin, so that the first definition in the Oxford Dictionary of the verb modulate is simply, “exert a modifying or controlling influence on.”

The word was given another specific technical meaning when it was chosen, in the very early 20th century by pioneering radio engineers, to describe modifying a carrier wave with a signal, or information, wave. In this mode, the word takes on a definite sense of shaping, even of sculpting, since the shape of the carrier wave is modified by the signal for transmission, and this is the means by which regulation occurs. This technical meaning has persisted in telecommunications, where it is now a fundamental transmission technique, and also in electronics.

In this article we wish the term modulation to ring with all of these meanings working together, in a manner that is close to Simondon’s usage of the word. The Simondon scholar Muriel Combes puts it best when she says that modulation is “the putting into relation of an operation and a structure” (Combes, 2013: 15). Here, she is using modulation

to describe the nature of Simondon's subtle concept of the allagmatic, his ontogenetic theory of operations, or transduction, that describes the constant bringing together of disparate structures in a creative process of individuation. Combes maintains that such individuation is modulation (2013: 5). Simondon's understanding of modulation brings together all senses of the term and extends the electronics/telecommunications sense, of which he was very much aware, to give equal weight to both participating elements in the modulatory operation, each influencing each other. He does this to oppose any sense of hylomorphism, where form is actively given to passive matter, preferring a kind of dialectical process where both elements influence each other equally and recursively in cycles of constant change. Adrian Mackenzie says that, for transduction to work, there must be "some disparity, discontinuity or mismatch within a domain; two different forms or potentials whose disparity can be modulated" (2002, 25). Deleuze and Guattari, in *A Thousand Plateaus*, acknowledge Simondon's understanding of modulation in relation to the hylomorphic idea of molding when they quote from his *The Mode of Existence of Technical Objects*: "modulation is molding in a continuous and perpetually variable manner" (Deleuze and Guattari, 1987: 562 n92).

Just as Simondon complicates and deepens the notion of modulation, avoiding any simple oppositions, so he does with the notions of being and becoming. He understands these two terms, not in fundamental opposition to each other, rather as dimensions or modes of each other:

*The being in which individuation comes to fruition is that in which a resolution appears by its division into stages, which implies becoming: becoming is not a framework in which the being exists; it is one of the dimensions of the being, a mode of resolving an initial incompatibility that was rife with potentials. (Simondon, 1992: 301).*

In a footnote to that sentence, Simondon further explicated the role of becoming, saying, "in a certain sense, ontogenetic development itself can be considered as mediation" (Simondon, 1992: 317 n2). In this mediating sense, we can understand modulation as becoming, although for Simondon mediation never refers to a third entity acting between two structures, rather he understands mediation purely as the process of interactive communication between the two structures, a process which always amplifies (Simondon, 1992: 304).

Finally, to understand Simondon's system—what Marie-Pier Boucher calls "the onto-epistemology of the emergence of living techniques as biotechnical individuals"

(Boucher, 2013: 92)—we need to grasp his understanding of the term information, yet another term to which Simondon added depth and nuance, and which is crucial to his philosophy. This understanding is distinct from the cybernetic understanding of information—an understanding heavily influenced by Claude Shannon’s theories—which Simondon accepted within a certain technological framework but wished to deepen. Rather than the technological idea of information as message, Simondon saw information as “the meaning that arises on the heels of a disparation” (Simondon, 1992: 316). He considered transduction to conserve information, in other words when two disparate structures are modulated, all information is conserved and magnified in the amplifying process that individuates a new being structured from the previously disparate structures, creating new informational structures in which meaning inheres. Here, we are asserting that we may, to a certain useful degree and with certain important differences, analogise Simondon’s overall system with the digital-data-display continuum, where digital data in its undifferentiated state is the preindividual metastable system from which any displayed phenomenon is individuated. Broadly speaking, this is because Simondon’s ontological assertion, with which we mostly agree, is that the “principles of the excluded middle and of identity are inapplicable at the level of the being since at this point individuation has not yet occurred” (Simondon, 1992: 312). We agree with his assertion about identity here, but we believe that, rather than the excluded middle, it is the principle of contradiction that is too narrow a concept to be properly applicable since both individual and milieu are created, preserved and amplified all at the same time. We discuss the implications of the principles of excluded middle and contradiction, in relation to the digital, in more detail below. In the meantime, if there were any doubt remaining as to what Simondon is saying here, it is dispelled when he says, “it could be said that the sole principle by which we can be guided is that of the conservation of being through becoming” (Simondon, 1992: 301, emphasis in original).

## The Technogenesis of Digital Ontology

Somewhat similarly, Mark Hansen sees Kittler’s thesis as indebted to an overly literal reading of Shannon’s famous work that formed the foundation of information theory, in which information and meaning are separated. Following from the ideas of Donald McKay (a contemporary of Shannon’s), where the interpretation of information is inseparable from its technical structure, Hansen prefers to see the differentiation of media as “inseparable from the cognitive activity of the brain,” with their role being to accord an expanded scope to embodied human agency (Hansen, 2004: 3; Hansen, 2006: 3). This technogenetic attitude is echoed, slightly more objectively, by Katherine Hayles, calling on the ideas of both Gilbert Simondon and contemporary neuroscientist Andy Clark, among others (Hayles, 2012: 13, 103). While these technogenetic ideas somewhat acknowledge the levelling nature of digital data, they do not sufficiently attend to the ontological significance of the data/display split, even in relation to the object-oriented network of dynamic interactions

they see as continually “cross-connecting machine processes with human responses” (Hayles, 2012: 13). Citing a Simondonian concept of epigenetic evolution, where humans co-evolve with technology in an assemblage involving complex temporalities, Hayles does not go quite as far as Bernard Stiegler, who repurposes the Epimetheus myth in order to show that humans have no essence separable from the technologies they require for life (Stiegler, 1998). Stiegler complicates temporality even further by asserting that technics, “far from being merely in time, properly constitutes time” (1998: 27). The logical conclusion of this train of thought is that ‘the human’ emerges as a post-facto image from particular technological situations (and not from all of them!), a conclusion that Hayles’s version of Simondon’s and others’ approaches does acknowledge without fully accepting, by insisting on the adaptive approach of epigenetic evolution (Hayles, 2012: 90). Francisco Varela’s work with organic living systems, abstracted to apply to the assemblages formed between technical systems and organic beings, also strongly informs this mode of thought. Varela talks of “embodied cognitive structures” and models of understanding based on “microworlds and microidentities,” as well as of knowledge that is “built from small domains” (Varela, 1992: 334). He defines embodied cognition as the experience of a body with sensorimotor capacities that are “themselves embedded in a more encompassing biological and cultural context” (Varela, 1992: 329). Deleuze’s reading of Spinoza’s concept of a body is available to apply this theory to digital environments, and many contemporary theorists of new media and affect have done just that, including Anna Munster, Claire Colebrook and especially Luicana Parisi in her book *Abstract Sex*. Parisi uses such readings to move beyond the dichotomy of embodiment and disembodiment. She also calls on Donna Haraway’s famous explication of the cyborg, reminding us of the need to revisit Haraway’s thesis in the light of the contemporary era of cyborgian digital networks (Parisi, 2004: 135).

## Consequences of the realisation of the universal machine

In both a Simondonian concept of technical beings and the contemporary turn towards object-oriented ontology, there is a risk of ignoring the crucial smoothness, plasticity and generic non-objectness of digital data-as-data, that is data not modulated into some display state. To speak of technical objects is to imply single-purpose machines (for example, Global Positioning Systems (GPS) trackers, Radio Frequency Identification (RFID) tags, mobile phones, social media websites, word processing software, and so on), ignoring the ontological significance of digital computers: that they represent the realisation of—for the first time in human history—the universal machine (Ceruzzi, 2012: 27). In other words, we now have machines that can become any other machine, and they do this by modulating digital data into some specific display register. As we saw earlier in relation to Kittler and media, it is only once digital data has been modulated into a display state that it can be said to be differentiated, and therefore to constitute an object that

has qualities, a technical being in Simondon's terms or a temporal object in Stiegler's. Yet, if time is constituted in technics and the human is constituted in co-evolution with technical beings, then must the concept of technology itself go the way of Kittler's media? Regardless—we can disregard it since the same logic of differentiation or simulated differentiation applies here, and since we are not interested in 'technology,' but the ontology of digital data specifically—it is clear that digital computers are, therefore, 'virtual' machines, highlighting the paradox inherent in Stiegler's claims, specifically, that humans are only, and have only ever been, 'virtually' human. [5]

## The virtual is not the digital

Even though the term 'virtual' has fallen out of fashion in media studies (much like 'simulation,' in the wake of Baudrillard)—mainly because it is mistakenly seen as a remnant of a failed disembodiment experiment in the 1990s—popular usage of the term has continued to grow in the era of digital social networks. Usually, it is used to denote anything that happens on a digital network and causes affect in the non-digital world, for example 'virtual sex' or 'virtual environment.' However, when we say that media has become virtualised, we do not mean it in the technical or digital sense, rather in the Deleuzian sense that Anna Munster uses:

*[T]he virtual dimension for corporeal experience evoked here lies in the way it poses the potential for embodied distribution as a condition of experience for information culture by dislocating habitual bodily relations between looking and proprioception. Virtual forces are vectors that pulse through the contours and directions of matter (Munster, 2006: 90, emphasis in original).*

Munster's words help us understand the apparent conflict between the levelling nature of digital data and the instances of specific differentiation caused by modulation into display by thinking of all elements in the modulation process as interdependently transformative negotiations of flows rather than assimilations of one thing into another. Later, we will see how this could help us also understand immanently digital entities and their relationship to the world. For the moment, though, we can see parallels between Munster's attempts to understand the levelled nature of the digital and Claire Colebrook's, when the latter calls on Deleuze and Guattari's concept of 'desiring machines':



*It is naïve and uncritical to see the analogue as a pure and continuous feeling or bodily proximity that is then submitted to the quantification of the digital, a digital that will always be an imposition on organic and vital life. There is, however, an inorganic mode of the analogue that is not a return to a quality before its digital quantification, but a move from digital quantities or actual units to pure quantities, quantities that are not quantities of this or that substance so much as intensive forces that enter into differential relations to produce fields or spaces that can then be articulated into digits (Colebrook, 2010: 124).*

Both Munster and Colebrook are concerned with interpreting Deleuze's nuanced philosophical concept of 'the virtual' in the light of the digital era and, like the Simondonian thinkers above in relation to technical objects, trying to understand the relationship between the digital and the non-digital (Munster, 2013: 8). We provided above a loose homology between the Spinozan metaphysics of substance-modes and the relation between data and storage/display states, which is undoubtedly too part of the appeal of Deleuze for scholars of new media (we will modify this homology below). What we can agree with is the resolutely anti-phenomenological approach taken by these writers. Data has no possible phenomenal presentation until it has been modulated into a display, and its very differentiation into such a state detains the excess of its not-thatness.

## Digital entities are performances

Even if we cannot simply assent to the accounts of embodiment generated by such Deleuzian-inspired accounts, we are in complete accord with their anti-phenomenological tenor. Precisely because of the necessity of modulation, no individual experience of any kind can offer more than an anecdotal testimony to the powers of new media. Rather, the problem is to reconsider the ontogenesis of the entities 'we' work with at the level of the interface, and this has to be constructed by way of absolutely non-phenomenal technical concerns. Yet there is still a value in showing the consequences of modulation upon the structuring of experience. Hence, as Boris Groys has pointed out in relation to digital images, the 'experience' of the digital becomes one of process, a performance (Groys, 2008: 84). As we have already implied, being qua data proceeds from its operations. When modulating some digital data into a display state and experiencing it as an image (say, in order to show a picture of your child to a friend on your phone), you can no more say that it is the same, or even a copy of the image you showed a different friend yesterday than you could say the D flat played by Martha Goldstein in her 1970 performance of Chopin's "Etude Op.25 No. 8" was the same D flat that Hermann Scholtz played in his 1879

performance of the same work, let alone the same D flat that Abel Tesfaye sang in The Weeknd's 2011 performance of their song "The Knowing".

We are careful here not to conflate this understanding of the performative nature of the digital with a too-simplistic assertion of digital data as script or score. Certainly, the use of protocols is an attempt to ensure a predictable display result, but as Sha recognises, performance is always privileged over the "instructions to the maker for use in the making" (Sha, 2013: 45). This is a properly Simondonian privileging of the process over the product.

## Modulation as contingent singularization of data

Within any digital system, the environment itself is digital data, with only the modulation into specific display states via various protocols allowing a chimeric, phenomenological differentiation. Because of this, the environment itself could at any time become input data to remodulate back into itself and vice versa. Any given element or assemblage (a web page, an image, a sound, an animation, a status update, a tweet) is only 'produced' at the time it is modulated into a corresponding display state: at all other times it exists as unmodulated digital data with no clear ontological state. This is true of all digital data. These may perhaps be termed 'immanently digital entities,' and could be said to be true of any and all of the excess of data created by the use of digital data and networks. 'Likes' and 'friends' and 'photos' and 'text' and 'links' and 'Tweets' and 'followers' and all other ostensibly differentiable digital phenomena—some of these may have identifiable provenance in the non-digital world, and some may be uniquely generated by and in the digital sphere, but all can be said to be 'immanently digital entities.' It is this problem, unique to the non-medium of the digital, that leads thinkers such as those mentioned above to concepts of 'inorganic life' and technogenesis, as well as scientists like Stephen Wolfram and Edward Fredkin to posit—in a move emblematic of Kittler's assertion that "media determine our situation"—an hypothesis of the universe as a digital computer (Kittler, 1999: xxxix; Chaitin, 1999: 108).

## The digital is other than the media that express it

The Wolfram-Fredkin hypothesis—that the universe is itself a kind of digital computer—is of extreme interest in this context, for a number of reasons. First of all, we can agree with

one aspect of their motivations for this claim: digital media do indeed reveal something previously unexpected about the natural structure of our universe. To summarise this aspect of their implicit reasoning as simply as possible, it is that the unprecedented powers of thought and action that derive from the electrification of Boolean algebra first established by Shannon, and now incarnated globally in the form of contemporary computing, must have some fundamental anchoring in 'being' for it to function at all (Shannon, 1937). Second, this means that to speak of 'digital media' is not simply to speak of a set of hardware and software components developed by a particular species on a particular planet at a particular time using particular materials: it is rather to be given a new access to being itself, and one which must thereafter guide our thinking of natural processes more generally. Third, if there remains something unthought in the Wolfram-Fredkin hypothesis, it is simply that there is something preprogrammed, indeed too representational, about the direct projection of a contemporaneously-dominant media paradigm onto being itself. Moreover, if the social conditions of such a projection are occluded, then we should expect such an occlusion to create certain symptoms too; not least the immediate carrying-across of a number of features of contemporary computing to nature itself in an unjustified manner. What we wish to do here, then, is radicalise the Wolfram-Fredkin hypothesis along logical lines. Above all, we agree that when we speak about the 'digital,' this must have an extension far greater than simply referring to the actualities of new media, at the same time that these new media must simultaneously function as our primary mode of access to this recognition. But we disagree that the universe is a computer. We believe, rather, that being is digital, if in a very particular sense.

## Digital ≠ Numerical

At this point we would do well to remember the difference between the digital and the numeric, quantitative or mathematical. Kittler and Deleuze (among many others) conflate the two, but in fact the digital is not necessarily numeric. The digital is rather a binary enactment of logical switches. The 'zeroes and ones' of popular parlance are not really numbers being fed to a machine (indeed, it is difficult to rationalize either zero or one as purely numbers anyway), rather they are symbolic placeholders for binary switches: on/off, +/-, yes/no, is/is-not (Chun, 2011: 139). The move to pure quantities is far easier to understand when we accept the numerical as simply another parameter in the modulation process between data and its display, and may help us move closer to an understanding of the relationship between the contemporary technical interdependence of virtual/material and the Deleuzian interdependence of virtual/actual (Nash, 2012).

## The digital renders number as rational ideology

In the present instance, then, the digital is not the numerical, but the two seem to enter a zone of indistinction, and the irreducibility of this indistinction is one primary mode of contemporary ideology. Numbers are themselves essentially ideological in a digital framework, because they appear as the only viable way of characterising the contingencies of actualisation (modulation and associated sub-operations, such as aggregation) that escapes pure assertion. What is peculiar about this ideology is that it is also essentially true: numbers (in the form of statistics, the modelling of rates of change on a mass scale, the correlation of data from an enormous range of different sources, etc.) are the only way to ensure a minimally rational comparability and consistency of data sets. Outside of such modelings, we have only the phantasms of opinion and self-interest. Unfortunately, being true does not at all prevent numbers from being iniquitously ideological, either; and they are ideological in this new sense, that they are produced on the basis of absolute binary operations whose operations vanish in the presentation of numbers, thereby also remodulating the data they present. The very organisation of data through various forms of modulation puts all sorts of pressures on the numbers that numbers themselves cannot say (Mackenzie, 2012: 335–350). We are thus committed here to understanding the digital as prior to number. Above all, we use this fact as a hint in our construction of a digital ontology. We maintain that it is vital to understand that to construct a digital ontology is to have recourse to a logical and not a mathematical ontology. But what does this mean?

## Towards a digital onto-logy

In his two major treatises on being and existence, Alain Badiou has offered a series of exceptional, ingenious propositions and arguments concerning the differing status of pure mathematics (in the form of ‘set theory’) and pure logic (in the form of ‘category theory’). [6] If one wants to argue according to reason—as distinct from proffering statements that are reducible to one kind of opinion or another—one has to take those discourses that take as their object the structure of reason itself as model. Mathematics and logic are those discourses. Yet their absolute affirmation of reason, or rather forms of reasoning, doesn’t mean that there aren’t still differences to be identified or arguments to be made; quite to the contrary, any attempt at reason necessitates an encounter with a rift at the heart of reason itself. This is where something like philosophy becomes necessary to evaluate and to decide on the distribution of rational tasks. For Badiou, ‘mathematics is ontology,’ which means simply that pure systematic mathematics is the discourse concerning being (2006, 4). Taking up the axioms of ZFC set theory, Badiou directly transliterates these axioms into meta-ontological theses, which establish for example the void as the proper name of being,

and the existence of infinite infinities. [7]

Precisely because set theory is ‘pure’ (that is, devoid of any direct empirical referent), ‘foundational’ (if only in the sense that all prior forms of mathematics can be rewritten without loss in its own terms), and ‘declarative’ (in the sense that it makes absolute assertions about the status of what entities exist), it can function as the grounds for a general ontology. [8] Logic, on the other hand, is strictly definitional without declaration; it speaks of, enables, the rigorous construction of potentially infinite different kinds of possible worlds (which cohere or consist), but doesn’t prescribe their actuality. In making this distinction, Badiou is forced to clarify that it also entails another claim: that ontology (the thinking of being as being) must conform to classical logic, that is, it is ultimately founded on the two principles of non-contradiction and excluded middle; whereas tendencies in contemporary logics, such as those that are broadly designated by ‘intuitionism’ or ‘paraconsistency,’ offer, respectively, their definitions on the basis of the primacy of non-contradiction without excluded middle, or on excluded middle with a modified principle of non-contradiction. [9] This for Badiou is not only because modern mathematics is axiomatised in its quest for consistency, and, by such axiomatisation, thereby also necessarily asserts what exists for it and how; it is because classical logic requires that something be or not be, without gradations or paradoxes within existence, in order to meet the criterion of univocity. [10]

We agree with Badiou on several fundamental points. First, that any consistent thought of ontology requires the rigour of mathematics or logic in order to be something more than one or another form of theology (disguised or not). Second, that the deployment of mathematics/logic must be undertaken in a foundational, and not in a descriptive sense; that is, what it prescribes cannot simply be ‘read off’ or projected onto the (phenomenal, empirical) world as we find it, and vice-versa. Third, that these procedures establish ‘objectivities’ prior to any subjective or phenomenological apparition. But we, four, disagree that ontology must be classical, as well as, five, that logic can only describe (and therefore does not prescribe) existents. So it is time for us to bring together all the points we have made above into a clear and distinct summary of digital ontology.

## The binary is not necessarily Boolean

In Shannon’s famous master’s thesis, he identifies an “analogue between the calculus of propositions and the symbolic relay analysis,” which runs both ways: at once to represent electrical circuits by logical relations, and logical relations by electrical circuits (Shannon,

1937: 16). As James Gleick summarizes Shannon's achievement:

*Like Boole, Shannon showed that he needed only two numbers for his equations: zero and one. Zero represented a closed circuit; one represented an open circuit. [...] Circuits in series, he noted, corresponded to the logical connective and; whereas circuits in parallel had the effect of or. An operation of logic that could be matched electrically was negation, converting a value into its opposite. As in logic, he saw that circuitry could make "if...then" choices (Gleick, 2011: 174).*

We note that, as essentially binary, Boolean logic is a classical mathematized logic: that is, it establishes an analysis of symbolic propositions which conform to non-contradiction and excluded middle. Yet recent developments in logic—those broadly denominated 'paraconsistent'—have attempted to construct logical systems in which contradictions are not necessarily 'explosive.' In traditional propositional logic, everything follows from a contradiction, but variants of para-consistent logic propose otherwise. As Greg Restall explains: Paraconsistent logics are distinctive in that they do not mandate explosion. [...] Instead, for paraconsistent logics the entailment fails [...] in the semantics for these logics there are interpretations in which A and -A may both be taken to be true, but in which not everything is true (Restall, 2006: 76).

It is essential here to understand that paraconsistency separates out contradiction from consistency, such that certain contradictions might be true, without all of them being so. Whereas consistency and the foreclosure-of-contradiction are identical in classical and intuitionist logics, this is not the case for paraconsistent ones. Moreover, this situation establishes the actuality that there may well be many different modes of constructing logical systems, even a kind of logical pluralism. This reopens the old question regarding the foundations of logic in a radical new fashion.

What we want to underline is that the instantiation of Boolean logic in post-war computing led very quickly to the appearance of a vacillation in the data computers were handling, such that paraconsistent logics initially came to be developed "to prevent computers, such as expert medical systems, from deducing anything whatsoever from contradictory data... because of the principle of *ex falso quodlibet*" (Meillasoux, 2009: 76). [11] This paradox—that the realization of Boolean algebra in computers thereafter opens up the peculiarity of computers generating certain classes of contradictory statements that Boolean logic itself cannot contain—is worth following through. Indeed, what we want to point to here (without being able to formalize our claims) is a possible extra-logical interpretation of a

binary logic: if the excluded middle can hold for a logic without a necessary or concomitant affirmation of the universality of non-contradiction, then we will maintain that a pure binary difference or what Badiou himself in a different context denominates “a Two without content” (Badiou, 2004: 209), lies at the basis of the digital universe. Excluded middle as a principle can be interpreted in such a way, given that it establishes a foundation for thought-being as an absolutely exclusive doublet without necessitating any other particular relations, predicates, positive terms or propositions to fill it. Such a Two as foundation would be neither strictly consistent nor inconsistent; it could not be any kind of One, either as whole or totality; it would, moreover, be a strange kind of local atomic particle divided against itself; being as a breach of being. Such an atom of digital ontology would constitute a rift before contradiction, which makes non-explosive contradictions possible or is in some way ‘tolerant’ of certain contradictions (note that we are proposing here a speculative grounding that would make such a logic onto-logical, not a specific translation of one or another paraconsistent system). [12] Unlike regimes governed by classical logic, then, such a digital ontology would render pure difference (not identity) fundamental; unlike intuitionist logic, digital ontology could also affirm actual infinities. One corollary is the possibility, even actuality, perhaps even necessity, of true contradictions; another is the patency of contingency in any modulation.

## Is digital ontology monist or dualist?

If, moreover—as we began by saying—everything is digital and the digital is everything, it now turns out that this is not quite true. The problem here goes back to one of the most fundamental of all metaphysical disputes: monism or dualism? Monism, in its classical form, holds that there is one and only one substance—that is, everything has the same ontological status—and differentiation must therefore be accounted for in terms other than those provided by substance itself. For monism, equality or univocity of being is primordial; differentiation is to be explained genetically. Monism tends to think immanently, but also totally, for it thinks in terms of ‘everything.’ In doing so, it presumes the whole. For dualism, on the other hand, there are fundamentally two different substances or a breach within substance—whether this is, as with the ancient atomists, the two ‘substances’ of ‘atoms’ and the ‘void,’ or, as with Descartes, ‘mind’ and ‘body.’ Differentiation is primary; relations thereby become problematic. Dualism tends to think transcendently, in the sense that it posits incommensurable orders of Being, but it also thinks partially, because division splits totality. The digital ontology we are proposing here is of especial interest in such a case, for a number of reasons—not least because being qua data (‘substance’) proceeds from its operations (‘the Two’), and not vice versa. So to speak of undifferentiated data is, strictly speaking, false: to continue the line we have already broached by speaking of digital ontology as founded on pure differences established by the primacy of excluded



middle, data should be considered a hyperdifferentiated consistency without identity. We thereby reiterate and extend our fundamental point about digital data, which is that it scrambles inherited metaphysical polarities. The principle of excluded middle rules the foundations of the digital universe, not the principle of non-contradiction. Digital ontology is paraconsistent, not classical or intuitionist.

## Differences of difference: from absolutely minimal difference to existents

So far, we have seen that what are usually referred to as digital entities are phenomenally differentiated only inasmuch as they are modulated into a display state and the resultant boundaries between them and their environment, or each other, is more or less arbitrarily determined by protocol. This is because such differentiated entities and their environment are made of the same stuff, and any such differentiation therefore only holds in the nostalgic McLuhanist sense, raising interesting questions about its ontological state. This is particularly true when considering the physical environment of digital data, that of the ferromagnetic material on the surface of the disk that stores the data. Illustrating our point about digital data not being 'numerical,' the binary switches of bits of data are represented on the disk by the direction of magnetism, either positive or negative. Initially we may be tempted to conclude that this is the environment in which the being of digital data occurs, but this is confounded by two facts. First, it need not be this magnetic material that stores the data—it could be punched cards, scrawls on a piece of paper (indeed, Alan Turing's original concept of the universal machine involved an infinitely long roll of paper tape with readable, writable and erasable symbols), or billions of egg cartons with each cavity either holding an egg or empty (Ceruzzi, 2012: 27). All that is required is a protocol to dictate how these recorded switches are modulated into a display state. Nonetheless, the fact remains that our experience of digital data in the world only involves ferromagnetic material and electronics, and we have never experienced digital data stored in billions of egg cartons, not least because speed of operation is a crucial factor. Yet our point here is that, at base, the digital is a model of logic, not a specific technology (Chun, 2011: 140). Second, and just as importantly, because the physical reality of the computer is an electronic and magnetic enactment of this logic, it is impossible to ever identify any specific being of digital data, since the 'movement' of data back and forth between disks, RAM (Random Access Memory), caches and registers on the CPU (Central Processing Unit), is in fact a constant process of modulation between states of magnetic polarity or electric charge in these

physical objects. Because of this, it is impossible to say that any given bit of digital data is even the same as itself, or point to its localisation or appearance in the world as a criterion or determinant of its identity, laying bare the fundamental spuriousness of the concept of a 'copy.' Data's 'identity' is a pure, non-phenomenal, distributed-cohering-across-materials. And, 'underneath' that, there are simply absolutely minimal differences or pure binaries—which are thus differences-without-identity, not subject to the laws of non-contradiction.

## Conclusions: Digital-Data-Display

On the basis of the current world domination of digital media, we have wanted to discern, albeit in non- or anti-Heideggerean terms, a new 'destining of being.' What this means is to identify within the actuality of the new media certain key points that have introduced unprecedented differences into the thinking and manipulation of nature. These differences subtend the antagonism that Heidegger saw as operative between the 'planetary reign of technology' and the precarious dis-closures of the poem. In doing so, we precisely targeted the digital aspect of these new technologies, and, even more precisely, their binary nature. Taking this binary nature with the utmost seriousness, we then suggested how it might subtend classical logics, including Boolean algebra; moreover, that such a structure could be foundational and not simply descriptive or representational. From there, we proposed a new abstract ontology that is integrally linked to contemporary computing and yet exceeds the restriction to its particular material situation. The digital universe comes to be founded upon local pure binaries without identity. Data, in turn, becomes minimally consistent sets of digital differences which do not themselves have a differentiated identity, yet which are essentially modulable. Display arises from modulating this data: what are usually called 'media' are the diverse modulations of this data according to patently-contingent technical display/storage protocols. To put this another way: logic enables us to propose absolutely minimal difference (in the form of pure binaries prior to content and thus contradiction) as pure being itself; mathematics to establish how such differences are given a necessary minimal coherence in actuality (in the abstract-concrete form of Boolean algebras); technics to produce and evaluate their instantiation as operatory machines (Shannon-Turing machines). Or, to put this differently, we have argued that: logic is the medium of being, insofar as it inscribes the necessity of pure minimal differences before contradiction; mathematics the medium that concretises minimal differences into consistency-without-phenomenal-identity as the possibility of any actualisation; technics the actualising medium of modulating these consistencies in turn. This tripartite distinction—difference, consistency, modulation—entails that all phenomenal presentations are at once infinitely variable as they are entirely constrained in specific ways.

To return to our beginning: we hope that it is now clear why we can draw from naturalist, historical and ontological accounts at the same time that we believe we can show in what regards they mistake certain crucial aspects of the nature and consequences of the event

of contemporary digital technologies. Moreover, our ontological construction enables the application of a set of discriminators that makes all talk of ‘originals’ and ‘copies’ otiose, as well as establishing the sub-structuring of the ‘necessary ideologies’ of such contemporary phenomena as big data.

We not only live a digital ontology — we are a digital ontology.

## Biographical Note

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## Notes

[1] Despite the title of Latour's book, *Reassembling the Social*, perhaps suggesting a sociological analysis, this is precisely not the case. As one of Latour's interlocutors puts it in an interview: "I got the feeling you're engaging in a full-scale war against all of the sociologists of the social..." To which Latour replies: "I want to develop one argument, which is completely orthogonal to sociology; which is connected to this obsession about non-humans and controversy," Anders Blok and Torben Jensen, *Bruno Latour: Hybrid Thoughts in a Hybrid World* (New York: Routledge, 2011), 160.

[2] See also: "Software such as codecs poses several analytical problems. Firstly, they are monstrously complicated. Methodologically speaking, coming to grips with them as technical processes may entail long excursions into labyrinths of mathematical formalism and machine architecture, and then finding ways of backing out of them bringing the most relevant features. In relation to video codecs, this probably means making sense of how transform compression and motion estimation work together. Second, at a phenomenological level, they deeply influence the very texture, flow, and materiality of sounds and images. Yet the processes and parameters at work in codecs are quite counterintuitive. Originating in problems of audiovisual perception, codecs actually lie quite a long way away from commonsense understandings of perception. Third, from the perspective of political economy, codecs structure contemporary media economies and cultures in important ways. This may come to light occasionally, usually in the form of an error message saying that something is missing: the right codec has not been installed and the file cannot be played. Despite or perhaps because of their convoluted obscurity, codecs catalyze new relations between people, things, spaces, and times in events and forms," Adrian Mackenzie, "Codecs", in Matthew Fuller, *Software Studies A Lexicon* (Cambridge: MIT Press, 2008), 48.

[3] See, inter alia, Ray Brassier, *Nihil Unbound* (Houndsmills: Palgrave Macmillan, 2007); Levi Bryant et al. (eds.), *The Speculative Turn: Continental Materialism and Realism* (Melbourne: Re.press, 2011); Q. Meillassoux, *After Finitude: An Essay on the Necessity of Contingency*, trans. R. Brassier (London and New York: Continuum, 2009).

[4] This is, once again, the professed basis of "software studies." In Manovich's words: "My book discusses what I take to be the key part of these 'machines' today (because it is the only part which most users see and use directly): application software," Lev Manovich, *Software Takes Command* (New York: Bloomsbury, 2013), 10. While we completely agree that such studies are necessary and desirable, here we want to underline that such an approach is still, despite its own anathemas against, say, Kittler's alleged 'modernism,' itself a modernist type of phenomenological humanism. This also goes for the field of so-called 'media archaeology' more generally, from Kittler himself through Jussi Parikka and beyond.

Even if there is a constant tension in such studies, between the places of the human and the non-human, they still retain a sort of minimal commitment to a form of ideology-critique, e.g., a la Jussi Parikka, *What is Media Archaeology?* (Cambridge: Polity, 2012). We would also include such writers as Alexander Galloway and Eugene Thacker here, for whom technical issues are constantly flowing into issues of power: see A.R. Galloway, *Protocol* (Cambridge: MIT, 2004) for several fundamental assertions in this regard. One crucial element in such studies is their absolutely vital emphasis upon the motivated contingencies that govern the complex stratifications (“layerings,” “protocols,” etc.) of contemporary control, which exceed and rebuke the inherited terms in which they are so often characterised; another is their (sometimes implicit, sometimes explicit) collapsing of the logical and mathematical bases of new technologies into technology itself. In all these cases, moreover, the phenomenology of modulation is taken as primary; and above all, the programming of modulation insofar as it primarily concerns ‘us,’ contemporary societies and users, at the level of interaction.

[5] See also Tom Boellstorff, *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human* (Princeton: Princeton University Press, 2008), 237.

[6] See Alain Badiou, *Being and Event*, esp. 6–9; A. Badiou, *Logics of Worlds*, trans. A. Toscano (London and New York: Continuum, 2009), e.g., “just as *Being and Event* drastically transformed the ontology of truths by putting it under the condition of the Cantor-event and of the mathematical theory of the multiple, so *Logics of Worlds* drastically transforms the articulation of the transcendental and the empirical, by putting it under the condition of the Grothendieck-event (or of Eilenberg, or Mac Lane, or Lawvere...) and of the logical theory of sheaves,” 38. It is crucial that, in both cases, mathematics and logics establish the formalization of objectivities prior to any subject whatsoever.

[7] “ZFC set theory” is shorthand for “Zermelo-Fraenkel set theory with the axiom of choice.” For a detailed technical discussion of some of the philosophical hallmarks of Badiou’s transliteration of axioms into philosophese, see J. Clemens, “Doubles of Nothing: The Problem of Binding Truth to Being in the Work of Alain Badiou,” *Filozofski Vestnik*, Vol. XXVI, No. 2 (2005), 21–35.

[8] For more extended discussion of Badiou’s use of set theory, see J. Clemens and O. Feltham, “Introduction” in Alain Badiou, *Infinite Thought* (London and New York: Continuum, 2003), 1–38; P. Hallward, *Badiou: A Subject to Truth* (Minneapolis: University of Minnesota Press, 2003); C. Norris, *Being and Event: A Reader’s Guide* (London and New York: Continuum, 2009).

[9] Badiou's own brief summation of the differences between these formations is very clear: "A classical logic simultaneously validates the principle of the excluded middle and the principle of non-contradiction (the truth of the statement  $p$  and that of the statement  $\neg p$  cannot be given at the same time). An intuitionist logic validates the principle of non-contradiction, but not the principle of the excluded middle. A para-consistent logic validates the principle of the excluded middle, but not the general form of the principle of non-contradiction. In each case, we are dealing with important variations in the definition and the meaning of the operator of negation," *Logics of Worlds*, 183. For an influential recent variation of para-consistent logics, see the work of Graham Priest on "dialetheism," for which a system can be inconsistent (i.e., generate irreducible contradictions from operations such as self-reference) but not be incoherent (i.e., not unusable), e.g., G. Priest *Beyond the limits of thought* (Cambridge: Cambridge University Press, 1995) and G. Priest *In Contradiction: A Study of the Transconsistent* (Dordrecht: Martinus Nijhoff, 1987). For his part, Newton C.A. da Costa, one of the ground-breaking logicians of paraconsistency, has recently written, with Decio Krause, first, that the development of paraconsistent logics does not make classical logic wrong (the former is a supplement to a field which now appears more restricted than previously) and, second, that paraconsistent logics may be of more use in explaining certain physical phenomena in an applied frame, see Costa, Newton C.A. da and N. Krause, 'Remarks on the applications of paraconsistent logics to physics.' available [philsci-archive.pitt.edu/1566/1/CosKraPATTY.pdf](http://philsci-archive.pitt.edu/1566/1/CosKraPATTY.pdf), downloaded 18 November 2014.

[10] In Badiou's own words, "A fundamental example of a classical world is ontology, or the theory of the pure multiple, or historical mathematics. This is essentially because a set is defined extensionally: a set is identified with the collection of its elements. This definition really only acquires meaning if one rigorously accepts the following principle: given an element, either it belongs to a set, or it does not. There is no third possibility," *Logics of Worlds*, 185. As he also puts it: "A classical world is a world whose transcendental is Boolean," *Logics*, 188 (emphasis in original).

[11] Note that Meillassoux himself is very hostile to paraconsistent logics, insofar as he believes they apply only to certain peculiarities in the handling of data, rather than to real states of affairs. For him, the law of non-contradiction is the key operator that enables thought to construct radical ontological propositions; for our part, we interpret his restrictions in this regard as symptomatic of a hostility to the revelatory powers of new technologies. Data is a real part of the world, not just a subclass of information about that world.

[12] See C.A. Middleburg's "A Survey of Paraconsistent Logics," in which some of the

key systems and approaches are surveyed, with their fascinating differences, e.g., with three truth values (true, false and both-true-and-false), relevance (the antecedent of an implication must be relevant to its consequent), non-truth-functional negation, non-adjunctive ( $A \wedge B$  from  $A$  and  $B$  fails), annotated truth values according to belief.

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## FCJ-174 Constructing the contemporary via digital cultural heritage.

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### Abstract:

The present article questions the construction of ‘the contemporary’ in digital cultural heritage archives as specific strategic articulations between past and present with regard to the future. A historical exploration of the discourse of cultural heritage presents three strategic axes supposedly executed by the archive. Via a fourfold problematisation of the notion of the contemporary these axes are further developed with regard to W.J.T. Mitchell and Georges Didi-Huberman’s respective readings of Warburg’s *Atlas Mnemosyne* and Malraux’s *Musée imaginaire*. The article finally questions the possibility of ascribing inherent epistemological, existential, empirical and geopolitical force to a given technological archival order.

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The digital cultural heritage archive appeared in the discourse of cultural heritage around the beginning of the new millennium and did so with certain specific goals—the digital preservation of and accessibility to cultural heritage should serve global tolerance, strengthen regional and national identity and, finally, inspire entrepreneurial creativity and innovation. The United Nations Educational, Scientific and Cultural Organisation (UNESCO), the predominant global agent of cultural heritage since the Second World War, has tended to express the potential use-value of cultural heritage by appropriating a quote from Arjun Appadurai: ‘Culture is the resource that society needs to move from today to tomorrow’

(UNESCO, 2010: 7). According to this discursive formation, operated internationally by UNESCO in parallel with its supranational and national counterparts, digital cultural heritage has a specific strategic temporality—the digital construction of the past as a force driving the present into the future.

This article examines the specific strategic temporality of digital cultural heritage archives. It briefly discusses both the long history and more recent digital development of cultural heritage archives, particularly via UNESCO's discursive framing of digital cultural heritage. It then questions the possibility of ascribing epistemological, existential, empirical and geopolitical force to a specific technological construction of the contemporary. It thus questions both the archival organisation of heterochronous objects in digital cultural heritage archives, and the shared temporality of communal formations that may congregate around them, that is, the possibility of collectively being in and for the same time.

To develop this line of questioning, the article takes as its theoretical point of departure Peter Osborne's (2013) fourfold (UNESCO, 2010: 7) problematisation of the concept of the contemporary: 1. The epistemological problem of the contemporary as Kantian idea, that is, as heuristic fiction without any actual object; 2. The existential problem of the necessarily anticipatory structure of fragmented time; 3. The empirical problem of the speculative fiction of the contemporary as both a disavowal of politics and a productive act of imagination; and, 4. The geopolitical problem of the contemporary as the only possible articulation of the regional or national discourse in a theoretically coherent whole of history.

This problematisation of the contemporary is developed through a study of two paradigmatic archival forms that are often claimed as forerunners of the digital archive: Aby Warburg's *Atlas Mnemosyne* (1924–1929) and André Malraux's *Musée imaginaire* (1947–1965). Through an engagement with two different readings of these archives, those of W.J.T. Mitchell and Georges Didi-Huberman, the examination of Warburg and Malraux then finally leads to the questioning of the present possibility of experiencing a heterochronous past of a coming community of memory via the digital cultural heritage archive.

## The presence of the past

Political initiatives and strategies for the technological preservation of national, supranational and international cultural heritage did not, of course, originate with the advent of the digital. The preservation of specific monuments has been a priority for

millennia, although the scope of the preservation effort has varied greatly through the ages. According to *The Modern Cult of Monuments* (1903), a classic description of preservation strategies by Austrian art historian Alois Riegl (1858–1905), antiquity and the Middle Ages acknowledged only ‘intentional monuments’, that is, ‘those works which recall a specific moment or complex of moments from the past’ (Riegl, 1982: 24). Within this framework, should the historical occasion of a given monument fade in importance or ‘commemorative value’ for its preservers, the monument’s protection would cease and its materials simply be repurposed for other endeavours.

Around the Italian Renaissance, antiquity’s appreciation of intentional monuments was joined by certain ‘unintentional monuments’ that obtained either an artistic or a historical value which transcended the specific identifications of ‘those for whom they had been erected and those who had an interest in preserving them [...]’ (Riegl, 1982: 26). The difference between the intentional and unintentional monument is, as the names suggest, that the commemorative value of the first is attributed to the monument by its makers, whereas the latter gains its value from the recipients of the monument if they recognise in it elements of historical or aesthetic value.

We can then, although somewhat reductively, distinguish three main Riegelian periods in our attitude towards monuments. Antiquity and the Middle Ages were primarily interested in the monuments explicitly meant for their attention and commemoration. This meant claiming a sort of immortality of the past, its unceasing monumental persistence in the prolonging of the present. Next, Renaissance Italy generated an interest in non-intentional monuments but still favoured monuments with an affiliation to related cultures of antiquity as the recovered source of their true identity. This meant including the achievements of earlier generations in a ‘notion of development’ from past artefacts to a future destiny which amounted to assuming ‘the heritage of related cultures of antiquity’ (Riegl, 1982: 28). This attitude, prevalent until the eighteenth century, acknowledged the passing of time but, nonetheless, attempted to suspend it by granting the past ‘a present-day value [*Gegenwartswert*] for modern life and work’ (Riegl, 1982: 26).

Finally, it is not until the nineteenth century and the new prominence of cultural history that an interest in the tiniest minutiae of the ‘developmental chain’ of history is established leading to ‘[...] the modern shape we know today [...]’: an interest inclusive of the smallest deeds and events of even the most remote peoples, who, despite insurmountable differences in character, allow us to recognize ourselves in each and every one of them’ (Riegl, 1982: 26). In addition to this enlarged scope that allows humanity to encounter itself where e’er it may venture, this attitude is also characterised, especially in its early twentieth century incarnation, by the appreciation of ‘age-value’, that is, the visible signs of time’s passing in the decay of monuments.

From the point of view of preservation, this age-value was at odds with the goal of historical value to preserve the monument in its given state of decay—neither allowing complete restoration (newness-value) or further decay (age-value). But already for Riegl, developments within the technical means of reproduction and, furthermore, dissemination of artefacts were seen as a way to ease the tension between opposing values:

*[...] the development of modern techniques of reproduction promises that in the near future (especially since the invention of color photography and facsimile reproduction) new and perfect means of compensating for the originals will be found (Riegl, 1982: 37–38).*

## Building blocks of the future

Since its early beginnings in the late 1940s, UNESCO shared Riegl's interest in the capacity of the latest technologies to both preserve that which could be lost and disseminate that which was not easily accessible:

*The Department of Cultural Activities also tries to recommend and promote the use of the most modern methods in the pursuit of its permanent aims—the preservation and enhancement of the cultural heritage of mankind, and the dissemination of culture (UNESCO, 1952: 378–379).*

At this time, UNESCO's 'modern methods' comprised the preservation of art and music reproductions on film, microfilm and records and dissemination was done via television, radio and 'special vans' bringing reproductions and books to remote locations (UNESCO, 1952: 379). The goal was to enlist the 'help of modern technology [...] to encourage a taste for, and knowledge of, the arts [...] to raise the average cultural level and to promote international artistic exchanges [...] with the object of improving the standard of living of contemporary man' (UNESCO, 1952: 379). Although the term is here used unemphatically, the aim of constructing the contemporary via technological preservation and dissemination of cultural artefacts should be noted.

The promotion of education via modern technology slowly entered the digital domain in the late 1980s and 1990s where the use of ICT (Information and Communication Technology) figures prominently in many UNESCO documents recognising:



*[...] the important role that the new information and communication technologies, and particularly informatics, can play in extending educational services to new sections of the population, and in improving the quality and efficacy of the educational process (UNESCO, 1987: 40).*

This introduction of information and communication technologies, ‘in particular those relating to informatics as a subject taught’, also aimed at ‘distance education’ (UNESCO, 1987, 43), thus continuing by digital means the earlier efforts of disseminating culture.

UNESCO’s educational effort explicitly demonstrated the understanding of the past as an untapped potential for driving the present into the future, when, in 1993, UNESCO established a World Commission on Culture and Development, claiming that ‘Genuine development can only be built on the basis of culture, which is its source, its mainspring and its ultimate goal. Ready-made imported development models have collapsed, because they have neglected the circumstances specific to each society, and the untapped potential of cultures’ (UNESCO, 1993: 1). In spite of a certain metaphorical confusion, culture is clearly presented as: firstly, a source or potential; secondly, the driving mechanical force of development, and finally, the goal of this development.

The reason for this final emphasis, on culture as goal, is further illustrated in 1996: ‘[...] culture shapes all our thinking, imagining and behaviour’ (UNESCO, 1996: 12). The idea was to implement ‘culture’ in ‘development strategies’ as ‘a central variable [...] if not the essence itself, of sustainable development, since attitudes and life-styles govern the ways we manage all our non-renewable resources’ (UNESCO, 1996: 10). Culture is thus crucial to ‘humankind’s creative capacities in the face of a treasured past and an unpredictable future’ (UNESCO, 1996: 10).

Whereas Riegl presented different commemoration values and strategies of preservation and wondered how to solve their inherent tensions, UNESCO focuses on the use-value of ‘a treasured past’ in ‘the educational process’ (UNESCO, 1987: 40) to further ‘human development’ and ‘human betterment’ (UNESCO, 1996: 7). For Riegl, use-value—a subcategory of present-day value—is expressed, for example, in the inhabitability of a house which, if inhabitable, must not be left to decay (age-value). For UNESCO, the use-value of heritage is a way of encountering an ‘unpredictable future’. There are no tensions between conflicting commemoration or preservation values, only the ‘untapped potential of cultures’. This is the ideological framework into which the term ‘digital heritage’ was inscribed when, in 2001, it first found its firm place within major UNESCO documents such as the Medium-Term Strategy and the General Conference Resolutions.

The movement from analogue to digital modes of use-value is evident in the move from 1952's educational couple of 'preservation' and 'dissemination' to the frequent coupling by 2001 of 'preservation' with 'access'. UNESCO becomes concerned with 'preservation and continuing accessibility' or 'preservation of and permanent access to digitally produced materials' (UNESCO, 2001: 71). According to UNESCO, the digital past should have a 'permanent' present-day use-value: 'The purpose of preserving the digital heritage is to ensure that it remains accessible to the public' (UNESCO, 2004: 75). And finally, the 'digital information life cycle' is described as going 'from creation to access' (UNESCO, 2004: 75). Access is presented here as the telos of creation.

UNESCO's focus on access reorders Riegl's perception of use-value and age-value. For Riegl believed that use-value would usually triumph over age-value as it makes no sense to leave a perfectly useful house to decay. However, if use-value was diminished enough, then age-value could reign free: 'Only works for which we have no use can be enjoyed exclusively from the standpoint of age-value, while those which are still useful impede such pure contemplation' (Riegl, 1982: 42). For UNESCO, however, age-value and historical value's concern for 'authenticity' and 'an authentic record' serve the purpose of optimising use-value in the form of 'potential of the heritage' as 'the building blocks of the future' (UNESCO, 2004: 75–76). The focus of the digital cultural heritage archive is on the preserved past as the building blocks of the future that need to be assembled in the present via unfettered access.

## Three strategic axes of digital cultural heritage

The goal of preserving the past in order to make it accessible in the present as building blocks of the future manifests itself in the general interest in digital cultural heritage archives from 2001 onwards across UNESCO, the EU and nation states. This strategic temporal construction seems to fall along three axes:

- Global tolerance by facilitating knowledge of the other;
- Regional and national identity through the knowledge of the self;
- Entrepreneurial creativity and innovation through the knowledge and possible exploitation of the abundant cultural resources inherited from our common forebears.

Admittedly, these axes are not new but in the shift from dissemination to access their

scope has changed. For example, ‘special vans’ are no longer needed to transport reproductions to remote locations. In fact, both temporal and spatial remoteness seem to have been vanquished altogether:

*The digital heritage is inherently unlimited by time, geography, culture or format. [...] The digital heritage of all regions, countries and communities should be preserved and made accessible, so as to assure over time representation of all peoples, nations, cultures and languages (UNESCO, 2004: 75).*

This goal of global representation and the beneficial consequences for our relation to the other, are not unique to UNESCO. They are further expressed as part of a general discourse of cultural heritage, for example in the plans for the European Union’s digital library Europeana, which acts as an Internet portal to a wide selection of European cultural institutions’ digital collections: ‘Improved access to our cultural heritage will create “unity in diversity”’ (Europeana, 2013: 5).

Not surprisingly, the second axis takes ‘identity’ as its watchword and is more prominent in supranational or national contexts, since global identity would coincide with the question of ‘unity in diversity’:

*[...] through the meeting, exchanging and sharing that culture entails, [a European digital library] can help to bring the European Union into closer contact with its citizens and a true European identity to take root and find expression’ (European Parliament, 2007: 3).*

Access to culture as the root of identity is also found on a national level. A report on the state of digitised cultural heritage in Denmark, for instance, clearly claims:

*‘Cultural heritage is of significant importance for the Danish sense of identity in a globalised world, and in these years, the importance of art and culture will increase. The government will therefore continue the work with communicating Danish cultural heritage, nationally and internationally’ (Digitaliseringsudvalget, 2009: 3). [\[1\]](#)*

We have already seen the third axis in UNESCO’s 1996 call for a closer coupling of ‘culture’

and ‘development’. It finds a more recent expression in a current UNESCO theme, ‘Protecting Our Heritage and Fostering Creativity’ (UNESCO, 2014), which in November 2013 fostered UNESCO’s fifth most popular tweet of the month: ‘Put culture & creativity at the heart of sustainable development & public policy! #supportcreativity pic.twitter.com/dcdCr1zk1B’ (UNESCO, 2013). Preservation and access—also referred to as ‘safeguarding’ and ‘sharing’—are aimed at supporting ‘creativity, innovation and the emergence of dynamic cultural sectors’ (UNESCO, 2014). And furthermore: ‘Both heritage and creativity lay the foundations for vibrant, innovative and prosperous knowledge societies’ (UNESCO, 2014).

These three axes also form the three main aims of the EU Horizon 2020 Work Programme for 2014–2015, although in a different order:

*The first aim is [...] to analyse and develop social, economic and political inclusion and positive inter-cultural dynamics in the EU. [...] The second aim is to foster the development of innovative societies and policies in Europe through the engagement of citizens, civil society organisations, enterprises and users in research and innovation [...] The third aim is to contribute to an understanding [...] of its cultural heritage and of its identities in order to strengthen cohesion and solidarity and to encourage modern visions and uses of its past (European Commission, 2014: 5).*

The formulation of each aim ends with the proclamation of its ability to support a general notion of innovation as bringer of economic growth. For example, the third aim of identity concludes:

*‘In these efforts, new technologies and digital cultural heritage should play an important innovative role as they enable new and richer interpretations of our common European culture while contributing to sustainable economic growth’ (European Commission, 2014: 5).*

The three aims of EU Horizon 2020 are formulated in the context of the current financial crisis. As has hopefully been demonstrated, though, these aims do not appear within the discourse of cultural heritage as a result of the crisis. They are but the culmination of a long development of a cultural heritage discourse with what is now a technologically enabled global scope. As mentioned previously, this scope is summed up nicely by Director-General of UNESCO Irina Bokova’s quote from Arjun Appadurai—a quote also used on numerous other occasions by UNESCO, including on Twitter: ‘Culture is the resource that society needs to move from today to tomorrow’ (UNESCO, 2010: 7).

## The idea of contemporaneity

Within the discourse of cultural heritage the contemporary is presented as a relatively uncomplicated gateway between past and future. Yet such uninhibited access is only possible via the strategic construction of the specific interactions between past, present and future. In order to question this construction, it is useful here to begin with the problematisation of the concept of the contemporary by Peter Osborne. Although his (2013) investigation of the concept of the contemporary aims to make the distinction between contemporary and modern art, his fourfold problematisation holds for our purpose as well.

The contemporary, Osborne argues, is an 'idea' in the Kantian sense, that is, 'its object (the total conjunction of present times) is beyond possible experience [...] and is hence a problem that requires investigation' (Osborne, 2013: 22). The idea as the representational form of reason, is thus distinct from Kant's two other representational forms: intuition as the immediate representation of an experiential object through sensibility and the concept as the representation of an experiential object mediated by other representations through understanding (Deleuze, 1984: 8). Such ideas are 'heuristic fictions' that may "regulate" experience as long as they are not contradicted by it' (Osborne, 2013: 22).

Apart from UNESCO's 1952 evocation of 'contemporary man', the term 'the contemporary' is not widely and certainly not emphatically used in the above-mentioned sources. The 'total conjunction of present times' is, however, distinctly operational in the specific ordering of the cultural past as 'untapped potential' in order to drive the present into the future. And not only do the presented sources claim a contemporaneity of global presents, they also claim a contemporaneity of global pasts: 'The digital heritage is inherently unlimited by time, geography, culture or format' (UNESCO, 2004: 75).

The specific temporal conjunction into which our three strategic axes are deployed constitutes the operational field of cultural heritage agents. The permanent present-day use-value of the past as the heuristic fiction of the unlimited contemporaneity of past and present is what allows for the constitution of cultural heritage as untapped potential.

What Riegl described as the recognition of ourselves in 'the smallest deeds and events of even the most remote peoples' (Riegl, 1982: 26) has now presumably been technologically relieved of remoteness. The recognition of ourselves and others via the heritage of deeds and events is open for creative innovation—a development which, we will remember, entails the shaping of 'our thinking, imagining and behaviour' as well as the management of 'all

our non-renewable resources'. The operations of the contemporary as unlimited temporal conjunction are thus a necessary presupposition for the strategic goals of the guardians of cultural heritage. The specific construction of the contemporary as idea establishes the terrain for these strategic operations.

## Existential time or standing reserve

The temporal conjunction of cultural heritage is, of course, an idea or fiction contradicted by experience in several ways, and is as such an epistemological 'problem that requires investigation'. Heidegger delivered one such investigation via an existential problematisation in which he argued that the present itself 'in its presentness, cannot be considered some kind of self-contained temporal receptacle for objects of experience, since it only exists as the differentiation or fractured togetherness of the other two temporal modes (past and future), under the priority of its futural dimension' (Osborne, 2013: 23). A common and false conception of time as a receptacle containing a past, present and future is only derivative of a more profound temporality (Heidegger, 2001: 374) which has as the 'ontological condition for its possibility, the state of Being of care' (Heidegger, 2001: 437). Care is here characteristic of Dasein which, in its thrownness, 'is essentially futural [...] only an entity which, as futural, is equiprimordially in the process of having-been, can, by handing down to itself the possibility it has inherited, take over its own thrownness and be in the moment of vision for "its time"' (Heidegger, 2001: 437).

This Heideggerian heritage is not a past as resource. For Heidegger, time is the 'unity of a future which makes present in the process of having been' (Heidegger, 2001: 374) and not the ordinary understanding of 'the world-historical [as] something present-at-hand which comes along, has presence, and then disappears' (Heidegger, 2001: 437). Nor is time in any way unlimited in this passing, it is directed towards its own end in death. Being 'for one's time' is a reckoning of time. It is an articulation and constitution of time itself, a specific singular temporality, and not the inscription of the self in the linear passing of time or in the eternal present of past time.

From this perspective, the very specific strategic construction or implementation of the past in the present as a driving force with regard to the future must be described as the ordering of culture in terms of the later Heidegger's concept of 'standing reserve' (Bestand). That is, the past in the present becomes a resource reduced to its ready availability with regards to a specific purpose: creativity and innovation as modes of actualising the 'untapped potential of culture' in the production of a specific future

(economic growth). This would also articulate certain reverberations between Riegl's rendition of recognition of the self in the tiniest detail of cultural history and Heidegger's critique of the technical attitude of 'Enframing' (Gestell) which orders a given entity as standing reserve. The human ordering of the entirety of being as standing reserve seemingly lets humanity meet only itself in the world: 'In truth, however, precisely nowhere does man today any longer encounter himself, i.e., his essence' (Heidegger, 1977: 27).

## Empirical time or imaginative disavowal

Next, the temporal conjunction of an unlimited past in an unlimited present is contradicted by experience on empirical grounds: 'There is no socially actual shared subject-position of, or within, our present from the standpoint of which its relational totality could be lived as a whole, in however epistemologically problematic or temporal-existentially fragmented anticipatory form' (Osborne, 2013: 23). The temporal conjunction of global cultural heritage operates as if this totality were an actual empirical entity liveable both as a resource shared by a global community and an individually accessible potential affording personal edification and development.

Such an entity is an operative fiction which amounts to a disavowal of politics in its postulation of a unity of time as standing reserve. It obliterates the possibility of any fundamental disagreement or dispute of history in favour of the tranquility of creative potential. On the other hand, it is also a 'productive act of imagination' positing this tranquil historical coexistence as a given. Or, in the specific case of global cultural heritage, the productive act of imagination of a 'heritage inherently unlimited by time, geography, culture or format' disavows all political disputes within that unlimited sphere in favour of the community of peacefully coexisting individuals engaged in creative and innovative pursuits.

We must acknowledge that in our present context, the rapid succession of technological generations is itself the necessary mechanical foundation of the fictional eternity of heritage. [3] Executive Director of the Digital Public Library of America, Daniel J. Cohen, states that far from the fetish of unfettered access to the eternally preserved artefact, the digital object requires 'a special set of eyes, often unique hardware, and an accompanying operating system and application software, to view or read them properly' (Cohen 2005, 15). As Wendy Hui Kyong Chun has argued, far from fulfilling 'the archival promise' of a calculable 'future simple' the digital format is but an 'enduring ephemeral' (Chun, 2008: 148–150).



## Geopolitical time and the task of the archive

In the very construction of its temporality, the supposedly limitless digital heritage archive projects an imaginary global present and therefore actively disavows any possible dispute, disagreement or strife. Yet there are many potentially antagonistic relations within this projected unity. For example, different postcolonial temporalities involve ‘not just temporal, but equally, indeed, in certain respects primarily–spatial’ antagonisms (Osborne, 2013: 25). This, of course, poses a geopolitical problem, and consequently, it poses a task. Such a task demands that the imaginary act of the contemporary be other than the constitution of a coherent whole of history, whether national, supranational or international. In this regard, Osborne explicitly references the young Nietzsche’s notion of the ‘untimely’ (unzeitgemäße):

*‘That much, however, I must concede to myself on account of my profession as a classicist: for I do not know what meaning classical studies could have for our time if they were not untimely—that is to say, acting counter to our time and thereby acting on our time and, let us hope, for the benefit of a time to come’ (Nietzsche, 1997: 60).*

For Nietzsche, history serves not a consolidation of time, but a challenging of the present in order to open up the future.

This was also Deleuze’s point when, still referencing Nietzsche, he located the untimely (intempestif / actuel) as the other side of Foucault’s archaeology: the diagnostics that brought archaeological analysis of what we have ceased to be into an emancipatory relation to our own becoming (Deleuze, 1992: 164). [\[4\]](#) This was also, finally, the crux of Agamben’s argument when he discussed Barthes’ explicit bringing of the Nietzschean notion of the ‘untimely’ into relation with the ‘contemporary’ (‘il contemporaneo’) (Agamben, 2009a: 40). For Agamben, to be contemporary is never to belong to or coincide with one’s time. Rather, the opening of time in con-temporaneity as being ‘for one’s time’ and not just engulfed in it, necessarily entails a challenging of the projection of a community of peacefully coexisting individuals engaged in creative and innovative pursuits.

## Grid vs. Vortex

So far, we have examined and problematised one of the main recent discourses of cultural heritage that has rendered possible and in many cases framed the funding of digital cultural heritage archives. The problematisation of 'the contemporary' has demonstrated that the idea of the contemporary is the presupposition that allows for the constitution of cultural heritage as the terrain of untapped potential for the three strategic axes of cultural heritage discourse. Yet we have seen that this potential rests on a specific temporality of standing reserve which ignores the possibility of a more fundamental existential temporality claimed by the earlier Heidegger. From an empirical perspective, it has then been suggested that the cultural heritage discourse projects a contemporary conjunction of temporalities beyond any liveable subject position and that it thereby entails the negation of any political disagreement or dispute with regards to the past. Finally, I have begun to suggest that this disavowal of politics poses a geopolitical task which—according to the tradition running from Nietzsche via Deleuze to Agamben—must challenge the unified contemporaneity of cultural heritage and instead consider contemporaneity as being out of time and 'for time' in order to bring about a time to come.

The digital cultural heritage archive is thus positioned within a battlefield of temporalities. The battle sees a singular temporality challenge the archive's supposed universal contemporaneity of presents and pasts, the temporal conjunction of heterochronous objects and the global conjunction of collectivities. In order to understand the privileged role of the digital archive within this battlefield, we must now consider the temporal constructions of more specific archival orders. Or rather, staying within discourse analysis, we should consider the discursive attribution of potential to certain archival configurations. If the digital cultural heritage archive holds a specific threefold promise as articulated along the strategic axes depicted above, how does the digital archival order honour that promise?

Aby Warburg's *Atlas Mnemosyne* and André Malraux's *Musée imaginaire* have both been referenced as paradigmatic archival forms of great promise ultimately fulfilled by their digital successors. [5] They supposedly held specific potentials for knowledge creation and a sense of human collectivity. W.J.T. Mitchell's and Georges Didi-Huberman's respective analyses of specific arrays, albums and atlases have both attempted to distill the respective characteristics of these two exemplars.

In a recent lecture entitled *Madness and Montage - Symptom and Symbol* from Aby Warburg to *A Beautiful Mind* (Mitchell, 2014b), Mitchell deploys a spatial dialectics between grid and vortex as a way of describing image arrays: grid representing rational Cartesian space and vortex as an expression of transformation, vertigo and madness. [6] Mitchell is less interested in the attempts to transform multiple images into 'unified artistic compositions', for example in Gerhard Richter's *Atlas* (1964–1995) and Robert Morris'

Untitled (Scatter Piece) (1968–1969), that could in themselves hint at, respectively, the grid and the vortex. Rather, Mitchell wants to examine the ‘provisional assemblage’, the operations behind the production of ‘image knowledge’.

Mitchell highlights two notable exceptions to the ‘normal practice in art history’ in which the display of image arrays is controlled in relation to a predetermined discourse or interpretation. Warburg’s *Atlas Mnemosyne* and Malraux’s *Musée imaginaire* instead acknowledge the provisional character of the assemblage. One common characteristic of these two arrays or assemblages, which renders them especially relevant to the present context, is that—similar to Riegl’s tentative technological solution to the tension between historical value and age value and UNESCO’s increased use of ‘the most modern methods’ in their pursuit of ‘preservation and dissemination’ and, later, ‘preservation and access’—they both consist of photographic reproductions.

Although the distinction was never explicit, one got the impression that, according to Mitchell, Warburg tended towards the vortex while Malraux tended toward the grid. Maurice Jarnoux’s famous depictions of the latter in his home (*André Malraux chez lui*, 1953) shows the floor covered by a nice grid of reproductions for his *Musée imaginaire*, a grid brought to only the slightest degree of turbulence around the feet of the organising mastermind. On the other hand, although Warburg’s plates do have a certain grid-like distribution, Mitchell quoted Didi-Huberman’s comments that Warburg’s goal was to set art history in motion:

*To create a knowledge-montage was [...] to reject the matrices of intelligibility, to break through the age-old guardrails. This movement, with its new “allure” of knowledge, created the possibility of vertigo. [...] The image is not a closed field of knowledge; it is a whirling, centrifugal field. It is not a field of knowledge like any other [...] (Mitchell, 2014b) [7].*

Mitchell ended his lecture by showing the art installation *T\_Visionarium* developed by iCinema which ‘offers the means to capture and re-present televisual information, allowing viewers to explore and actively edit a multitude of stories in three dimensions’ (*T\_Visionarium*, 2008). The digital installation demonstrated how the current enormous capacity for capturing, storing, displaying and manipulating data can move from grid to vortex in an instant. As Mitchell concluded: ‘If we are to study the totality of the world’s images, we had better get used to vertigo’ (Mitchell, 2014a).

## Album vs. Atlas

Mitchell proposes to analyse image arrays as a dialectic between grid and vertigo, between synchronous order and productive madness, one based on simultaneity, the other on futurity. Any image array will interface between the two; with Malraux a bit more on the side of the grid and Warburg more on the side of the vortex. Similarly, Didi-Huberman spends the better part of a recent book, *L'Album de L'art à l'époque du « Musée imaginaire »* (2013), presenting a fundamental conflict between Malraux's Album and Warburg's Atlas as two opposing ways of approaching pictorial heritage.

Didi-Huberman perceives Warburg's Atlas—with its arrays of heterogeneous reproductions indistinctly related to a given theme or *Pathosformel*—as a fundamental complexity which can never be resolved into a unifying concept, a complete archive or a strict classification (Didi-Huberman, 2011: 20). This observation is based on the claim that images;

*[...] if organised in a specific way offered us the possibility—or, rather, the un-depletable resource—for a rereading of the world. [...] [The Bilderatlas] offered [...] an apparatus for setting thought back in motion, exactly where history had stopped or where words were still lacking. It was the matrix of a desire to reconfigure memory by refusing the fixation of memories—the images of the past—in an ordered, or worse, definitive, narration (Didi-Huberman, 2011: 20–21).*

This imaginative perpetuum mobile is 'thus our heritage, the heritage of our time' (Didi-Huberman, 2011: 21); a heritage which is both aesthetic and epistemic in that the new aesthetic forms entail a new approach to knowledge.

For Didi-Huberman as for Mitchell, Warburg presents an articulation between grid and vortex, between 'raison et déraison' (Didi-Huberman, 2011: 22). Didi-Huberman is, however, explicitly critical of Malraux and his Album for snapping the images too firmly to the grid; for losing sight of the 'mad' end of Mitchell's spectrum. [8] Although Malraux claimed that, contrary to the affirmation of the traditional museum, his *Musée imaginaire* was an interrogation (Malraux, 1999: 176), Didi-Huberman accuses Malraux of instantly answering his own questions (Didi-Huberman, 2013: 31). If Malraux claims his Album to be what Mitchell called a 'provisional assemblage', Didi-Huberman claims that this provisionality is directed solely towards a 'unified cultural composition'. In spite of the intended dialogue between reproductions of artefacts from the remotest as well as the most familiar cultures,

this dialogue was never allowed to go astray, dissolve into nonsense or get stuck in irresolvable tension or conflict. It was always brought back to ‘a stylistic or spiritual synthesis which grounds its notion of universal “art” or “creation”’ (Didi-Huberman, 2013: 41).

The Musée imaginaire is the authoritative accumulation and presentation of timeless genius. It is open insofar as new or unknown old works of genius can be added, but closed with regard to a historical challenge of universal human essence. It is thus a re-sacralisation—the reproduced work is included in the church of universality. And this re-sacralisation is quite literal, insofar as many of the works included in the Musée imaginaire are often former religious sculptures wrenched from their erstwhile cultic context and re-inscribed into the cult of universal cultural heritage. [9]

Where Walter Benjamin would have argued for the technologically induced decontextualisation of the reproduced work of art as potential emancipation from tradition in the passage from cult-value to exhibition-value (Benjamin, 1968a), Malraux re-inscribes the object in the universal eternity of the Album form of his Musée. For Malraux, the emancipation of mechanical reproduction is what allows the possible decontextualisation and subsequent inclusion in universality: ‘In this way reproduction frees a style from the limitations which made it appear to be a minor art’ (Malraux, 1974: 22). Mechanical reproduction salvages the artefact from its contextual limitations in order to include it in the family album: ‘[...] photography imparts a family likeness to objects that have actually but slight affinity’ (Malraux, 1974: 21).

Malraux’s praise of the present presence of the accumulated past in the universal eternity of cultural heritage can be gleaned in crystalline form from a speech he gave to Gaullist intellectuals in Paris on March 5, 1948: ‘And in this hall tonight, we can say without ridicule: “You who are here, you are the first generation to inherit all of earth”’ (Malraux, 1989: 273). [10] All of earth can be included in the family album and we can all be the first descendants of that arche-generation.

## Profanation

Didi-Huberman accuses Malraux of re-sacralising the decontextualised artefact and praises Warburg for his archival vertigo, ‘a movement demanding all the anthropological aspects of being and time’ (Didi-Huberman, 2004: 13). Maurice Blanchot captures re-sacralisation quite well in one of his essays on the Musée imaginaire:

*[W]ho looks at Gothic statues? We do; the others invoked them. The consequence of the disappearance of prayer was to make monuments and works of art appear, to make painting an art within reach of our eyes (Blanchot, 1997: 15).*

We no longer invoke, we look, study and appreciate, and according to Malraux this gaze gives access to a universal essence of the human instead of a more Warburgian problematisation of time and being. The problematising temporal dynamism of Warburg's project is clearly expressed in his description of the *Pathosformeln* as 'disconnected dynamograms', where images cut off from their original constellations of meaning 'reacquire their efficacy every time they encounter the artist (or the scholar)' (Agamben, 2009c: 57).

As is not unexpected from an accusation of re-sacralisation, Didi-Huberman finds salvation in a gesture of profanation. At more or less the same time as Malraux was being photographed at home surrounded by photographic reproductions for his *Musée imaginaire*, Chris Marker and Alain Resnais presented a short film entitled *Les Statues Meurent Aussi* (1953). [\[11\]](#) In a style reminiscent of Malraux's photographic reproductions, Marker and Resnais show various African artefacts, scenes from African and western culture and various western appropriations of African culture.

*When men die, they enter history. When statues die, they enter the realm of art. This botany of death is what we call culture. [...] An object is dead when the living gaze which rested on it has disappeared. And when we have disappeared, our objects go where we send those of the négres : the museum (Marker, 1961: 11).*

The museum is a sacralising mausoleum that wrenches the cult object from its origins and forces it into the history of art [\[12\]](#):

*Classified, labeled, preserved in the glass showcases and in collections, they enter the history of art. Paradise of forms where the most mysterious kinships are established: we recognise Greece in a more than 2000 year old African head, Japan in a mask from the Ogooué, or India, the Sumerian idols, Roman figures of Christ or our modern art (Marker, 1961: 20).*

The kinships of the museum unhindered by geographical or cultural distance supposedly allow for the identification of any individual with the universal human. In the specific temporal conjunction of past and present in the museum, humans recognise only themselves.

The film stresses the problem that this universalising celebration of culture glosses over: the very real oppression, exploitation and estrangement behind the accumulation of artefacts. A black woman is shown in front of a shop window displaying African statues and shortly thereafter a white man is shown teaching a young black man how to make cheap reproductions of African art objects. In spite of the hopes of Benjamin, the loss of cult-value has not challenged the ruling class or private property. It has only reinforced white hegemony and black estrangement.

The end of the film affirms the possibility of the black artist to say No! Whether in the boxing ring or on the concert stage, the black artist tries to literally strike back, to 'give back the punches his brothers receive in the street' (Marker, 1961: 24). The movie shows a black man with a camera aimed directly at the screen:

*He even dares to take a camera to create for himself the historicity of his struggles or the state of our own cultures, thus partaking in the mastering of reproducibility and the possibility of looking at us, in all the meanings of the word (Didi-Huberman, 2013: 166–167).*

Didi-Huberman clearly sees in the recapture of the means of mechanical reproduction a possibility for a challenging of the universal time of the Album, that is, a temporal dispute otherwise disavowed by the projection of universal time by the discourse of cultural heritage. [\[13\]](#)

Didi-Huberman thus presents the challenging of universal time in *Les Statues meurent aussi* as a mode of profanation akin to Warburg's Atlas—the only resolution to a conflict which he describes by referencing Walter Benjamin. The conflict between universal and singular time is described by Benjamin's distinction between a universal history whose 'method is additive; it musters a mass of data to fill the homogeneous, empty time' (Benjamin, 1968b: 262) and Benjamin's materialistic historiography which locates 'a configuration pregnant with tensions' (Benjamin, 1968b: 262) enabling the constellation of a specific now with a specific past in an emancipatory break with the steady flow of progress (Didi-Huberman, 2013: 171).



## A coming community of memory

Both Warburg's Atlas and Malraux's Album have been seen as forerunners for contemporary digital archives and Mitchell correctly locates their unification in something like the T\_Visionarium, the interface of which (large curved screens from floor to ceiling) can visually change display types from grid to vortex by the push of a button. For what is the digital archive but the zone of indistinction where grid and vortex coincide? Even beyond the interface, at a very material level, digital memory and storage, from the Williams Tube over spinning Hard Drives to current Solid State Drives, have always been characterised by a grid either flickering, fading or in rapid motion (Chun, 2008).

The digital archive is, in its modes of preservation as in its modes of access, a grid in movement and it seems that this digital whirling of the grid inspires new archival hopes in both the powers of re-sacralisation and the emancipatory efforts of profanation. 'We had better get used to vertigo', Mitchell said. But when the digital grid's vortical movement is the condition of possibility of the universal history of cultural heritage, can it then truly be said that 'if organised in a specific way' images or cultural artefacts still offer us 'the possibility—or, rather, the undepletable resource—for a rereading of the world' (Didi-Huberman, 2011: 20)?

Is it indeed possible to attribute inherent aesthetic, epistemic or political characteristics to a specific organisation of cultural artefacts? And is the black artist's ability to strike back by 'partaking in the mastering of reproducibility', to 'create for himself the historicity of his struggles or the state of our own cultures', not also a partaking in the reproduction of Malraux's pose at home where the grid only whirls at the feet of the organising mastermind? Is not the T\_Visionarium as the 'means to capture and re-present televisual information, allowing viewers to explore and actively edit a multitude of stories in three dimensions' exactly the present day culmination of Malraux's re-sacralisation where any vertiginous rearrangement of the provisional assemblage is re-inscribed in the Album of the database?

It is necessary here to insist again on the question of attributing inherent epistemological, existential, empirical and geopolitical force to a given technological archival order (grid/vortex, album/atlas) and the consequent constructions of the contemporary as, respectively, universal and singular time. In a digital age, Warburg's Atlas is not inherently a good a model for materialistic historiography. It can most certainly be considered a tool for such a historiography, a trace of its maker's singular practice. Yet we should be wary of

generalising its historiographical qualities beyond that specific instance, especially as an adoptable mode of profanation. This will just snap the vortex back to the grid.

Claiming a specific archival distribution as the presupposition for a specific construction of the contemporary must be abandoned as pure mimicry of the discourse of cultural heritage. We should remember that the latter desires nothing but the archive as the 'undepletable resource for a rereading of the world' which Didi-Huberman saw in Warburg's Atlas. Indeed, in spite of his tendency to attribute inherent emancipatory powers to the Warburgian image array, Didi-Huberman does seem to acknowledge some of the problems involved. A crucial aspect of this is the need for a radical rejection of a claimed causality between archival distribution and construction of the contemporary. Didi-Huberman writes: 'Since the Lumière brothers filmed their *Sortie d'usine*, it has become easy to film regular people. The whole question is knowing how' (Didi-Huberman, 2012: 198).

The question is not one of arrays or archival order nor of recapturing mechanical reproduction to master one's own story. In the age of digital reproduction, that has become easy. The question is 'knowing how' to profane: 'Profanation is the counter-apparatus that restores to common use what sacrifice had separated and divided' (Agamben, 2009b: 19). Profanation is neither the destruction of the sacralising apparatus of cultural heritage discourse nor is it the 'correct' use of its archive (Agamben, 2009b: 15). Rather, profanation brings the past out of its role as standing reserve or eternally present use-value. Profanation seeks to render the discourse of cultural heritage inoperable by freeing the past from its necessary re-inscription along the three strategic axes and to establish the possibility for new use which is not premised on a presupposed use-value. This can only be done via a problematisation of the unified temporal conjunction of the contemporary to which the discourse of cultural heritage contributes.

In this respect, Mitchell establishes a dialectical spectrum, a zone whose articulations remain too indistinct. Didi-Huberman, on the other hand, sometimes loses his way in the zone of indistinction and sees profanation in vortexes already too close to the grid. The indistinction between presupposed use-value and the potential for common use not amenable to re-sacralisation must be clarified by a reengagement with a notion of 'the contemporary', similar to the one Deleuze located in the critical diagnostics of Foucault's archaeology. We need an archaeology of the discourse of cultural heritage to provoke an *experimentum monumenti*—an experience of the conflicting presents of the past, the heterochronicity of monuments and the shared temporality of community as irreconcilable with the eternal presence of the past and the universal essence of the human. Only such an archaeological experience and its ensuing diagnosis of the contemporary will enable us to be 'for our time', act counter to our time, on our time and, let us hope, for the benefit of a time to come.

## Biographical Note

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## Notes

[1] All non-english references are translated by the author.

[2] In 2003, UNESCO included 'intangible cultural heritage' and thus included heritage beyond physical artefacts.

[3] With regards to an accelerated succession of 'generations' it would be interesting to question the current status of Jan Assmann's distinction between 'communicative memory' as a non-institutional, disembodied memory reaching 'no farther back than eighty years, the time span of three interacting generations' (Assmann, 2010: 111) and 'cultural memory', institutionalised and guarded by specialists, reaching 'back into the past only so far as the past can be reclaimed as "ours"' (Assmann, 2010: 111). Such an analysis does not, however, fall within the scope of the present article.

[4] Nietzsche's formulation of the untimely as quoted above played a central role in Deleuzian philosophy from the earliest works to the late readings of Foucault, c.f. in *Difference and Repetition*: '[...] philosophy is neither a philosophy of history, nor a philosophy of the eternal, but untimely, always and only untimely - that is to say, "acting counter to our time and thereby, acting on our time and, let us hope, for the benefit of a time to come"' (Deleuze, 1994: xxi). It should be noted, however, that 'intempestif' only becomes synonymous with 'actuel' in the later works. In his 1962 book on Nietzsche, 'intempestif' is on the contrary synonymous with 'inactuel', cf. (Deleuze, 1962: 122), due to the French translation of Nietzsche's *Unzeitgemäße Betrachtungen* as *Considérations inactuelles*.

[5] '[...] almost every major museum claimed and still claims that its Web site is André Malraux's museum without walls'. (Chun, 2006: 23) and '[...] digitization has been trumpeted

as a way for libraries finally to fulfil their mission: to accumulate and provide access to human knowledge. Digital archives are allegedly H. G. Wells's "World Brain" and André Malraux's museum without walls, among other dreams, come true' (Chun, 2011: 137). 'In other words, similarly as the photographic and new image cultures in the early part of the twentieth century forced not only a rethinking of perception but also of collection, memory, and organisation as was evident for example in Aby Warburg's work [...], now software cultures demand a rethinking of similar extent' (Parikka, 2012: 90). See also Berry et al, (2013).

[6] Mitchell's lecture is studied here in two versions, one in Berlin on April 10 2014 and one in Copenhagen on April 23 2014. The Copenhagen edition was experienced in person while the Berlin edition was watched on the website of the conference Image Operations: <https://www.ici-berlin.org/event/571/>. Quotes from the Copenhagen edition are taken from an unpublished handout of the lecture's manuscript.

[7] Mitchell quoting (Didi-Huberman, 2004: 13). The passage can also be found in French in (Didi-Huberman, 2013: 115).

[8] Didi-Huberman is mainly critical of the Malraux of the *Musée imaginaire* and on. He sees in Malraux's earlier writings from the 1930s a 'bien pensé' emancipatory challenging of the past, whereas the later Malraux turns into a 'bien pensant' mainly interested in preserving his own position as organising mastermind. A critical rereading of the earlier Malraux as a challenge of the 'bien pensé' description would be valuable but surpasses the scope of the present article.

[9] Malraux was familiar with such wrenching from his youth when in December 1923, after an unfortunate investment in the Mexican mining industry, he sought to alleviate his financial ruin by stealing devata statues from the Cambodian ruins of Banteay Srei.

[10] Cf. also (Malraux, 1974, 46).

[11] Parts of the movie were censored until 1963, that is, including during Malraux's tenure as minister for cultural affairs from 1959. Incidentally, Resnais married Malraux's daughter, Florence, the year of his resignation from the ministry in 1969.

[12] For a recent criticism of UNESCO's 'World Heritage' listing as the transformation of a city into a mausoleum cf. (D'Eramo, 2014). For Agamben's description of the sacralising function of the museum and the 'World Heritage' listing as well as the need for profanation cf. (Agamben, 2007: 83–85).

[13] Malraux is here taken as protagonist of the discourse of cultural heritage. And not without reason. Both before, during and after his tenure as minister for cultural affairs from 1959 to 1969, Malraux had a profound influence on UNESCO, e.g. via numerous speeches from 1936 even until twenty years after his death where UNESCO played a recording of a 1960 speech of his in his honour. UNESCO states: 'Mr Malraux, who praised the "act by which man snatches something from death," formulated for the first time the concept of the universality of cultural heritage, which thereafter would stand at the heart of UNESCO's actions in the field of culture'. <http://www.unesco.org/bpi/eng/unescopress/96–210e.htm>.

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## FCJ-175 Humans at play in the Anthropocene

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### Abstract:

The arrival of the Anthropocene recognises the significant global impact of human activity on the Earth's ecosystems. Building on Huizinga's understanding of the relationship between play and culture, this essay explores the role that play could have in survival strategies or to provide awareness of the impact of human processes in the Anthropocene. In this worldview, play has a primary function in culture through its role in modelling modes of human survival: simulation is good tool for understanding the impact of systems on the world; play enables the possibility to become adaptive and 'hack' the world as conditions change; and lastly, play suggests that a changed philosophical perspective may offer an evolutionary edge for survival in a changing world. Drawing on Lévy, Bogost, Harman and Parikka strategies for play are explored using micronations and pervasive games; demonstrated and illustrated by analysis of games from recent experience within the Micronation of Ludea.

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*Culture arises in the form of play, that it is played from the very beginning. Even in those activities which aim at the immediate satisfaction of vital needs –hunting, for instance–tend, in archaic society, to take on the play-form. Social life is endowed with supra-biological forms, the shape of play, which enhance its value. It is through this play that society expresses its interpretation of life and the world (Huizinga, 1949 : 46).*

## Introduction

The Anthropocene marks ‘a new phase in the history of both humankind and of the Earth, where natural forces and human forces become intertwined.’ (Zalasiewicz 2010: 2231). It is the current time in which human processes such as culture and language, the use of tools and technology, are acknowledged as part of the earth’s ecology—and as integral to the operations and behaviours of the earth’s ecology largely through material forces.

We are living in the first geological time period during which human activity plays a significant role in shaping and changing the environment—transformations that are usually attributed to geological events. The Anthropocene, is an epoch that some argue begun with the European Industrial Revolution and thereby bought an end to the Holocene. The idea of the Anthropocene has gained currency over the past decade with scientists, geologists and others, as there is increasingly clear evidence of the impact of overpopulation, pollution, and human development on the environment. This impact is largely expressed through climate change and species extinction. The existential risk of human extinction via runaway climate change or ecological disaster is implied in the definition of the Anthropocene through its focus on human activity as the primary force shaping our current moment on the geological time scale. Chakrabarty draws attention to aspects such as the planet’s temperature zone that ‘work like boundary parameters of human existence’ (Chakrabarty 2009) that challenge one of the basic assumptions of history – the continued existence of the human species. He argues, like many others, that the old divide between human history and natural history can no longer be seen to exist, and chooses to focus on species history. In this context, humans may be described as geological agents as through our collective activity we are changing the geological conditions of the world. The two main signs of this are global warming and the loss of biodiversity, although the complexity of environmental impact extends into many other domains.

In this worldview, play has a primary function in culture through its role in modelling modes

of human survival: simulation is good tool for understanding the impact of systems on the world; play enables the possibility to become adaptive and ‘hack’ the world as conditions change; and lastly, play suggests that a changed philosophical perspective may offer an evolutionary edge for survival in a changing world. This ‘system awareness’ gives players (humans) literacy, and as a result, agency as they see themselves not living in a human-centred world but rather a complex ecology—a complex system—in which they participate.

This essay explores the rise of playful culture within the context of the Anthropocene. It argues that play enables increased awareness of complex adaptive systems such as the environment; and explores the potential for this worldview to inspire play cultures that modify human behaviour to regenerate the environment, particularly within public space in urban areas.

The impact of global environmental change and the loss of biodiversity clearly indicates that increasing human population and development is unsustainable. Arguably, the origins of the Anthropocene lie in an anthropocentric worldview—a history of thought that sees human beings as central to the world, and the most important lifeform in the environment. Anthropocentrism has dominated the traditional view of the non-human world throughout modernity, and also manifests in games—in that they are about a (human) player and their experience. However, games also introduce a systemic approach that engages the player in a wider set of connections and relationships with many non-human entities. In this way play can potentially offer perspectives that challenge the dominant anthropocentric worldview.

The rise of the Anthropocene coincides with a rise in interest in play within the developed world. Huizinga argues that play is at the foundation of culture—before language—in that humans (and other animals) play games to learn skills, establish social systems, and understand their world. Taken literally, play becomes everything. This is an interesting lens through which to view culture and society but the more importantly, it recognises that play is a process for deconstructing and exploring systems. Much of the world (rocks, organisms, water, plants) existed before people; the emergence of play within the Anthropocene brings humans—and their systems—back into play with the wider world. This different worldview has two effects for humans: firstly, an increased literacy in systems and processes; and secondly, the potential for play as a process for understanding and, potentially, impacting on the flow of ecological systems via feedback or reprogramming.

This perspective sees the entire world as a playground, not just the spaces we typically associate with games. There is a history of play that has occurred in cities over the past

century, but it is in this century with the emergence of ubiquitous media public expressions of play have become more widespread within urban environments. Increased interest in—and creation of—micronations plays with notions of sovereignty and related cultural forms; pervasive games take play to the streets; and the processes of cities are revealed through mixed realities made of people, infrastructure, rules, devices, surveillance, and media creatures, in combination with a myriad of other systems, objects and organisms. An understanding of how we are living in a mixed reality in which objects, systems, humans, and media coexist is central to this worldview.

There are a number of ways in which the potential of play preceding—or creating—a culture engages with the Anthropocene. Working on this basis, this essay begins by articulating humans at play as a productive force, then contextualises this play in mixed realities—an enabling environment that allows for new relationships and processes; and, finally explores some of the experiences and structures produced by these connections as demonstrated through practical examples and conceptual projects that explore play in public space at a micro and macro level.

Transgressive acts, while perhaps not intended within existing technological infrastructures, are possible—even enabled—by rules and systems. Play in public space is transgressive in itself, as most public spaces with the exception of actual playgrounds, are not designed for this activity. The emergence of flash mobs is one example of this, and the popularity of street games is another. As games are integral to our culture they can also change the world (McGonigal, 2011) by encouraging play with the world, as a form of dialogue, deconstruction, conversation, framework, context; essentially play is an approach to the new world we inhabit. Game designers see a game as ‘a problem solving activity, approached with a playful attitude’ (Schell, 2008), what if players use this approach in daily life? Play in public space, for example, changes the relationship between player and their world by decoding moral and social boundaries previously invisible to them, shifting their role from acceptance to a more empowered position through their knowledge of implicit rules and the potential to break, change or subvert them.

These processes, environments, and experiences demonstrate the new potential for play in relation to our understanding of humans in the Anthropocene. They suggest that play is a transgressive act on par with a situationist intervention; and a potential means of survival, such as the productive process of playfighting in animals that prepares them for their world. Equally, it offers a worldview that reveals the complexity of the Anthropocene and the myriad of non-human entities that come into play when staging games in public space. This aspect of engagement with the non-human is a key difference between play in urban spaces now, and that which occurred during the last century.

## Humans at play

Play precedes culture (Huizinga 1949) and games and play are instrumental in the formation of culture and society. Callois (1961) expands on the practices and processes of play defining it as either *ludus* (governed by rules and systems—the playground) or *paidea* (free and improvised). Rodriguez (2006) has connected Huizinga’s cultural theory with ‘serious game design’. Lévy articulates a model that may be used for understanding humans at play and that articulates the ways in which these systems process the world. He defines four modes of being: possible, virtual, real, and actual (Lévy 1998). This approach when applied to urban space can be seen as an overt actualisation of the many vectors of virtual potential at play in the city: combinations of people and happenings, sound and site, information and object, game token and location, data and habitat, device and place. The city itself is a media ecology in which our lives and selves are shaped by media; ‘we do not so much have media as we are media and of media’ (Parikkia, 2010: xvii). This systemic understanding of rules and non-human agency offers the possibility of another non-anthropocentric worldview that remains within the context of the Anthropocene.

Hayles (1999) argues that those of us who depend on technology in our daily lives are already posthuman. By way of example, play can have a physiological effect: certain types of play can activate brain plasticity (Kühn et al, 2014) causing the brain to grow or repatch itself. Studies of learning and brain function in players present ideas such as ‘gamer intelligence’ (Wouters et al, 2013) and ‘process literacy’. The former is the theory that by exercising the brain by playing certain types of games the brain can become more resilient and reactive; the latter is the ability to problem solve and reason by modelling the simulation of processes in the brain. Bogost (2008) calls these processes ‘unit operations’, a model that mixes structuralist approaches with computation, particularly the ways in which computers form patterns of information from smaller, interconnected and related units. This methodology, alongside Lévy’s model, provides ways to understand the processes at play in contemporary games and the ‘new citizens’ that play them by looking for unit operations within cities and other environments for pervasive games.

Forrester modelled these processes in his early work on ‘urban dynamics’ (Forrester, 1969), which was subsequently used to model the processes that construct urban spaces in SimCity. There is a rich history of play in the city, with the situationists looking for ‘a new urbanism that would allow for play and experiments, and favour psychological games, which would be an improvement over the ‘labyrinth’ (Hollevoet, 1992 : 31); and who also drew on Huizinga for inspiration. The situationist city (Debord, 1994) or a digitally augmented psychogeography allows for the exploration of mixed realities in terms of their poetic and expressive potential. These games are similar in spirit to the earlier ‘new

games movement' (New Games Movement, 1976) as the 'situationist game stands out from the standard conception of the game by the radical negation of the ludic features of competition and of its separation from the stream of life' (Debord, 2014 : 154), through tactics such as the *dérive*. The mixed realities of the urban gaming group Blast Theory eloquently demonstrate that the collapse of time and space (Blast Theory, 2001) may occur in cities. In the present day, media ecologies and mixed realities situated within the cities themselves have come to also reflect these processes. Knowing these processes makes the city playable as it opens up its systems and rules for game design.

This is in contrast to a more formal urban context for play—the playground. The playground provides 'a free society in miniature, with all the same tensions and ever-changing harmonies, the same diversity and spontaneity, the same unforced growth of co-operation and release of individual qualities and communal sense, which lie dormant in a society devoted to competition and acquisitiveness.' (Allen, 2014 : 78) Sørensen's posited his vision for the 'playground' (Sørensen, 2014 : p.88) as early as 1935 which was later recognised as the adventure playground, a public space set aside for play which was made from 'real' materials. Later, Nielsen's 'model for a qualitative society' (Nielsen, 2014 : 148), shifted the location of the playground to the museum, shifting the meaning again by challenging the codes of public space.

So, after Huizinga we have three different views of play in the city: Forrester's 'urban dynamics', the city as process; Debord's unplanned journeys; and the modern idea of the playground. Play in public space is shown to be important for decoding the city and, through play, the human becomes an agent in the process of becoming which subsequently changes our relationship to the city. Play in mixed realities builds on, yet is different to that of these precursors. Firstly, players in mixed reality games come with sophisticated process literacy; and, secondly, urban spaces have tangible codes and systems meaning that play in mixed realities involves non-human entities as much as human players. These important shifts in the knowledge and skills of the players themselves, and the nature of urban space opens up the possibility of play to have an impact on our understanding of the Anthropocene via mixed realities.

## Play in the Anthropocene

Play offers a form of cultural adaptation for dealing with the effects of the Anthropocene: radical destabilisation, rising seas and increased temperatures. Play offers a new type of citizen, fluent in simulation and process and able to modify rules and systems that can

change the environment in which they live. This is play as a survival strategy through mixed realities that make tangible non-human systems and the impact of humans on these. Play enables us to hack and recode these systems. In this way, play becomes a transgressive act that changes the rules and systems of the world by 'reprogramming reality'.

The primary mode of play in mixed realities is the 'pervasive game'. Pervasive games create temporary anomalies in the public space of cities where the usual rules do not apply. Taking reality as their medium, there are various approaches—paranoia inducing alternate reality games; sport-like street games; location-based games—all of which engage with public space in different ways. Some use technology, such as augmented reality (AR), to mix layers of audio-visual content into the city that literally mix different realities into and onto one another. Alternate Reality Games (ARGs) use existing elements of the world and remix or recontextualise them into their narrative in a way in which the boundary of the game world is not fixed, anything may be part of the game and often is. Street games play with teams and goals, although rather than operating on a constructed, separate playing field (like a sport) they appropriate readymade tokens, boundaries and play elements from the world around them. These could be street signs, pedestrians, plants and other objects.

The world becomes the site, the context, or the scene for play. In and of itself this is a transgressive act—both for the game and for the world. Games are usually played out in controlled spaces, where the designer can stage the action, as well as design and measure the play experience for the player. As a form of game design, it is highly experimental and fraught with many challenges. For the world, play in public space challenges the rules and conventions of that space, often breaking, deconstructing, and revealing these rules and systems.

Some of these actions may be overt. Pervasive games, whether augmented with technology or using simple analog systems, impact on a site via the creation of spectacle. The participants adopt a different set of rules and as a result behave differently in public space. Often these rules are simple enough so that they may be decoded by spectators observing the behaviour of those at play; raising questions as to who is playing, why are they playing, what are they trying to achieve, and/or should we join them? The presence of these games extends outside of the actual moment to a virtualisation in the form of images and video captured on smart phones that then spreads the game logic and behaviour like a meme (perhaps with relevant hashtags). Of course, for all this to happen it has to be a good game and a story worth telling and therein lies the challenge—giving the action meaning so that it becomes adopted as another layer of code and part of the city itself.



The small screen of mobile devices can also be considered in terms of the potentialisation of the city—what can happen with what is here now? This may occur within a constrained set of possibilities presented in a mixed reality game, rich in meaning via connection with other players, the scoring of points, achievement of objectives; or be more freeform, finding resources, meeting a friend, joining a flashmob. Arguably, the game mode makes the choices made and the actions taken realise a more meaningful actual outcome because they are framed within a context—the narrative or the proposed goals of the game. Optimising day-to-day life with immediate, situational data is useful but being engaged in a process that is transforming the city raises the stakes for the individual to another level.

What of the machines? So far in this essay, I have adopted a human centred position in all of this; but human processes are not the only ones at work in this space. In mixed reality gaming agency is given to programs, objects, systems, sensors, machine vision, and tracking devices. This vast network of objects is busy constructing mixed realities. Objects and machines are equal contributors in this exchange, and are often partners in feedback loops. So how may we recognise their role in the game? Objects don't have to be material to be real; this raises the question as to when an object arises and has meaning, for example, drones sense things differently, but in the same time and space as humans. Is their perspective less significant than that of a human who is also in the same game? In *Alien Phenomenology* Ian Bogost proposes that we spend time 'meandering in an exotic world of utterly incomprehensible objects', to explore and understand their ways of being; to speculate on the world from their reality; 'to write the speculative fictions of their processes, of their unit operations'. (Bogost, 2012 : 34) Understanding and perceiving the world through this view is part of the toolset of players engaging with mixed realities that gives them insight into the systems and processes that make up cities.

While it is beyond the scope of this paper to explore in depth the ontology of mixed realities, exploring the ways in which a consideration of mixed realities presents a non-anthropocentric view of the world is important in understanding the opportunities for players in the Anthropocene. The nature of this space and the opening up of its rules and systems via games and simulation is dependent on a particular cultural context for play. The concept of the Anthropocene while placing the human at the centre of the world—aggregate human activity is directly linked to global environmental change—also dwarves the human by acknowledging the scale and complexity of this impact. The human is one agent in a vast network of material relations, part of which are the mediated communications of humans and machines, including machine-machine relations. It is this second aspect that expands this worldview further into the domain of the non-human systems and processes that mixed realities are made of.

Harman's notion of the quadruple object (Harman 2011) introduces an ontology that describes a number of different processes of interaction between objects. In this model a micronation, a game, a person, and a city may be considered in relation to one another. Harman's quadruple object broadens and flattens our perspective of mixed realities; and enables us to look at them in the space of an object-orientated ontology in which players, devices, codes, entities, asphalt, and chalk can all be considered alongside each other. Bogost examines the quadruple object in connection with unit operations to produce an alien phenomenology that enables speculation on how the world is experienced from the point-of-view of devices, codes, and entities; and 'names the logics by which objects perceive and engage their worlds' (Bogost, 2012 : 29). In this framework, all objects are included in the world and relations between objects are framed via the same rules whether they are animal, vegetable, mineral, or technological. Each object is defined as having four aspects: a real object and a sensual object, which have both real qualities and sensual qualities. The sensual object and its qualities come into play when the object interacts with another object—they are revealed and activated by the interaction. However the real object and its qualities remain hidden, underneath the surface, only revealed when certain conditions are met. For example, an AR marker will present different sensual qualities to a digital camera coupled with an image recognition process to those that it presents to a human reading the same marker on the street. This approach makes a lot of sense in the context of games and mixed realities as it is not human-centred, and therefore allows discussion of relations between the diverse range of objects found in a mixed reality on a level playing field.

Further to exploring a non-anthropocentric worldview, Jussi Parikka's insect media (Parikka, 2010) presents a media ecology that captures a larger overarching system. Again, presenting a different set of relations: swarms, hives, networks, and the emergent complexity of a multiplicity of small interactions in opposition to the hierarchical design of a constructed world, this approach acknowledges a 'whole new world of sensations, perceptions, movements, stratagems, and patterns of organisation that work beyond the confines of the human world' (Parikka, 2010 : ix). This is a macro perspective of the city as a hive of interactions and connections mediated by the micro object-object relations that give rise to mixed realities. This worldview, with Harman's ontology, provide a framework for understanding the system awareness enabled by playful culture and games in the Anthropocene.

The player in the Anthropocene is aware of their world being the result of complex adaptive systems and vast interconnected networks, the player has shifted away from being a localised, human-centred construct to being a node in a wider world. The mixed realities of cities provide a rich diversity of potential interactions for many different forms of play. Seeing the city as game opens up these possibilities for humans, and for them to use play as transgressive act to recode their environment.



Figure 1.

## Rise of the micronation

So, how are mixed realities expressed in the world and how can we articulate these expressions? In the context of the Anthropocene, we can look at the actions of players in relation to the world around them in terms of transgressive acts that challenge the rules of play. If humans as a species are geological agents then the ways that they interact with the planet may be analysed as unit operations or members of Harman's ontology. They could be seen as survival strategies, ways to understand or cope with the changing environment, perhaps to generate new rules of play that counter the negative impact of human habitation in the world. This would bring the process around full circle in which

play once again becomes culture, and on an optimistic note, a culture that brings balance to the actual ecology itself. A more negative view suggests play as a coping mechanism in a dying world—it is just for fun or perhaps a type of training—cognitive and physical—that enables players of the world a more optimal strategy in adapting to changes resulting from the depletion of resources or shifting territories.

Huizinga argues for the role of play in the formation of culture. This approach to play predates the emergence of immersive digital games, highly connected interactive environments, and spaces augmented by connectivity and layers of information. Humans, as players, are now shaped by their experience playing games—a ‘Ludean’ worldview—and largely exist in a ‘gamified’ environment in which statistics, feedback, both raw and processed data, connectivity, rules and systems, artificial entities, and processes are endemic. While the basis of the Anthropocene is the result of the escalation of material processes such as overpopulation and global environmental change, it is coupled with a world in which technological change in developed nations is both contributing to and enabling these processes, as well as measuring and communicating their effects. While the original premise behind much new technology is increased efficiency, better communication, higher productivity, and so on the same infrastructure—or systems of logic—may be used to play other games with the world.

A playful approach to the world is empowering for the individual and provides critical feedback to the world via disruption. An example of this strategy in action is evident in the increasing interest, and creation of, micronations. These are actual or fictional nation states that play with alternative rule sets for culture and society. Micronations are not a new development. The oldest micronation in the world, San Marino (Figure. 1), was established in 301, forming its constitution in 1600. Landlocked in Italy, its full title is ‘The Most Serene Republic of San Marino’, and it has survived the unification of Italy, several conflicts including two world wars, Italy’s fascist movement, and the formation of the European Union (the micronation is not a member). According to the 1933 Montevideo Convention on the Rights and Duties of States defines a nation as requiring only four aspects: permanent population, defined territory, government, and a capacity to enter into relations with other states. Chakrabarty differentiates between species history and the history of capital in trying to understand human behaviour in the context of the Anthropocene. The survival of the human species does not require humans to function at the massive scale at which we currently do. Processes such as agriculture and industrialisation enable this scale of human activity to be possible driven by the drive for the accumulation of capital. In many ways micronations map the Anthropocene and provide alternative patterns of human behaviour such as in the village of Marinaleda (Hancox 2013) located in Andalusia, south of the kingdom of Spain. In this village of 2700 people, land and food are shared amongst the collective.



These four aspects are open to interpretation. For example, a population does not have to be geographically based it simply needs to have consistent criteria for membership. Equally, defined territory in the context of mixed realities can be established in many ways, it could be through a game world or a distributed territory, or perhaps a very small urban space or interstitial zone. Government can be equated to a set of game rules or system that provide codes for the behaviour of its citizens. A game is a type of government—when you play you submit to the rules of the game to participate. You play along. Finally, once defined as an entity with a name, constitution, perhaps a national flag then the capacity to enter into relations with other states becomes possible. Once again, mixed realities offer many ways in which this could happen. Playful encounters or urban interventions may present ways to enter into relations with other states.

More recently, many new micronations have emerged that demonstrate this kind of playful interpretation of these rules. This reflexive play indicates a kind of process literacy in more ‘permanent’ objects such as countries. Over time micronations emerge and are actualised with material properties (defined territory), entities (permanent population), rules (government), and effects (relations with other states). Seen in this way, a playful approach to nationhood allows the manifestation of many other possible structures that constitute a micronation, and an acknowledgment of the abstract nature of the persistent aggregates of rules and systems that are countries. The nature and constitution of micronations vary widely, examples include The Principality of Sealand, Freetown Christiania, and Neue Slowenische Kunst. (Ryan et al, 2006). However, as they are recognised often as playful experiments with the rules of nation building, they always retain an aspect of the virtual—fluid and mutable.

## The Micronation of Ludea

This image (Figure 2.) is from Hosier Lane in the city of Melbourne. It depicts a cloud of abstract glyphs—orange, green, and blue floating above the street. It is emblematic of a place—that is everywhere and nowhere—but exists in cities everywhere; and the process of articulating and finding this place.

That place is the Micronation of Ludea (Innocent 2005, 2010, 2013, 2014).

If you have played a game then you have been to Ludea. It is that space you go to when you are ‘in-game’, in the zone, or otherwise immersed in play.



figure 2.

For the Ludeans, this state is the basis of their culture, their language, their way of life. Patterns and the logic of the game become their way of seeing the entire world. The ontology of the game world is the ontology of their reality. Reality is game. This “place” provides a way into the new space of play described earlier.

This is where the Micronation of Ludea is located—floating in mixed realities—the interconnection of different worldviews, sensory systems, and ways of being; a multiplicity of possible cities coexisting in the same space (Figure 3). Locative media, augmented reality, wireless networks and other technologies enable these forms of being in many ways. Not only do the media have the ability to direct the flow of people and objects using instant messages and the tagging of locations with data and media, but media also enable the capacity to set up protocols and systems to connect and automate these processes. Entities leaving traces in the city, simulated cities overlaid actual cities, and transmedia ecologies all point to the multiplicity of this space rather than a singular point of view.

Humans, as players, are fluent in the processes that build cities and nations, and while acknowledging the present moment, the current instance of a nation, they also recognise that the micronation is the product of processes, and has a life of its own. It is an object in,

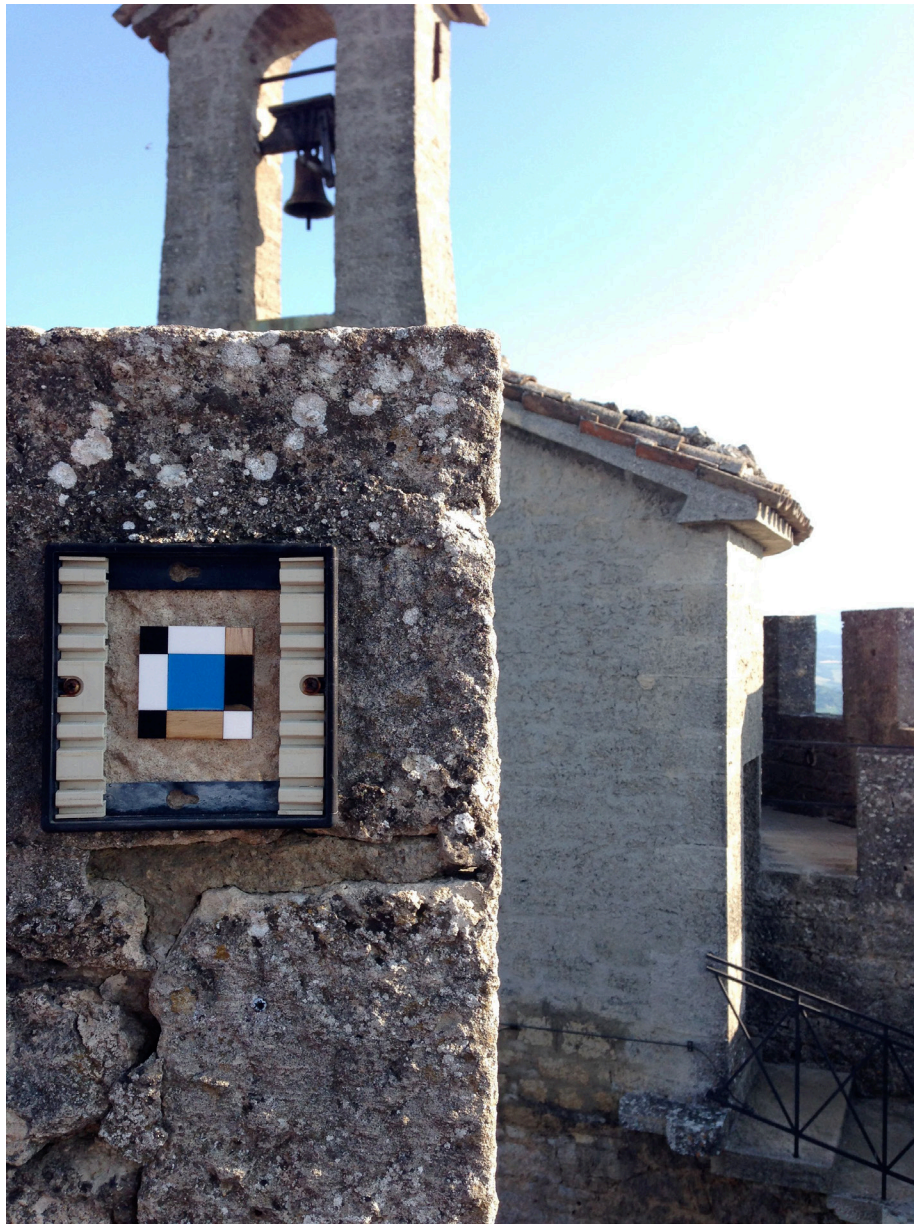


figure 3.

and of itself, and it is shaped and moulded through its interaction not only with its people but with the myriad of other objects that emerge from it: languages, media, rituals, armies, streets, plumbing, technologies, as well as humans, animals, plants and so on.

Creating a micronation means playing with these rules, with these possibilities of socio-political processes, the forces that shape culture, peoples, wealth, cities and all the other things that go into making a nation. The micronation offers a unique viewpoint from within the system; freeing up agency and expanding the knowledge of how playful intervention could shape these systems.



The Micronation of Ludea (established 2005) makes play its central governing system. It is a social experiment in placing—or breaking—the ‘magic circle’ (Huizinga 1949) around the micronation itself. Everything is play, and play is everything. The Ludeans come from a generation that has grown up with games, abstract machines, and digital processes. It has become second nature for them to make abstractions of reality in terms of models, systems, processes, and flows. This is ‘gamer intelligence’ in action; ‘process literacy’ in play.

The Micronation of Ludea is both an actualisation of game logic and a virtualisation of the city; as a framework it is ongoing project/place/context to look at how the logic and codes of game worlds are used to augment urban space and generate play.

Within the framework of a fictional state, the Micronation of Ludea manifests via a series of public artworks blending street art, formal abstraction, augmented reality, and game design that explore the idea of city as game. These works are socio-political experiments that play with the conventions of behaviour and the occupation of public space, and the ways in which these are tested when codes and the logic of game worlds are used to augment urban space and generate play. They largely manifest as pervasive games.

One of these games is based around the activity of ‘urban codemaking’ (Figure 4). In this street game, originally staged in Melbourne during 2010 as part of the City of Melbourne Laneways Commissions, the idea of ‘rezoning the city through play’ is explored.

Urban planning is typically a lengthy bureaucratic process that aims to balance a network of systems and rules that are social, institutional, spatial, commercial and cultural. The modern city is made of rules and systems, similar to Forrester’s ‘urban dynamics’ on which SimCity is built. Somewhat like SimCity but rather than being ‘god’ of the simulation the players of Ludea are worker ants or nodes embedded in its system. They ask, what if players recoded the city from within as multiple agents in an intimate conversation with the city via actual and virtual technologies manifesting real and potential cities. The Micronation of Ludea proposes street games that engage players with cities using languages of play (nonverbal languages of entities, actions, tokens, and processes) that open up new forms of dialogue with the codes of the city.

Urban play strategies enabled by transmedia storytelling alter our experience of the contemporary city. Over the past two years the Ludeans have developed an approach to urban spaces called ‘urban codemaking’ that draws upon the pictographic language of





figure 4.

travelling hobos, the spatial narrative of game worlds and generative systems as tools for urban design. The street game draws upon the mythology of a fictional universe, pervasive gaming methodologies, and strategies for urban renewal and intervention. This story is told via a game that follows players across social, digital and physical spaces within the city.

The game creates a different set of relations with the world and a different worldview as a player. This is significant because, as pointed out by Huizinga play has an important role in the formation of culture. The role of play in cultural production is a central theme of the Micronation of Ludea, which proposes a theoretical experiment—a society ruled by systems of play. This is a poetic expression of contemporary developments in the developed world, in which players already engage with reality, particularly the mixed realities of cities, in new ways both mentally and physically.

Another game, called ‘noemaflux’, embeds the language of Ludea in urban spaces turning familiar locations into readymade game worlds. noemaflux describes an act of shifting perception. The work is centered on an augmented reality that enables different ways of

seeing the city. This experience is constructed via a network of relationships that connect AR markers, urban space, generative writing systems and abstract electronic spaces.

Players use mobile devices to explore streets and laneways and find nine signs integrated into the urban environment. The signs act both as navigational signage in urban space and as gateways into the artificial world. The signs have dual meaning both as elements of an invented language (that of an artificial world) and as a machine-readable language (as AR markers). Players discover worlds through these markers and being in these worlds triggers the growth of abstract writing systems. As they move about the city they carry digital seeds that pollinate each site with glyphs from the previous site creating a crossmedia ecology connecting people, urban spaces, signs and digital systems.

Familiar urban spaces are reinvented and inscribed with new meaning via a mixed reality. Firstly, established technologies of augmented reality such as AR markers are given a new aesthetic via their integration into sculpture, street signage and banners. Secondly, the city is reinvented through the creation of a new space in which streets and laneways overlap with abstract virtual worlds. Via these dual processes of interaction players become interconnected with the artificial world of the work and the urban landscape in which it is situated.

In this game, machine vision introduces another level of code. The two most common forms of machine-readable markers are QR codes and the fiducial markers (Figure 5) often used in AR. QR codes are matrixes of pixels that have little meaning to humans except to signify that they may be scanned to provide a link to a web address. Fiducial markers come in many shapes and forms and in addition to signifying the presence of a portal to a mixed reality, they are signs in and of themselves. They may be presented as nondescript matrixes of black and white pixels, or be aestheticised and made part of the street itself. In figure 5, a 'noemaflux' marker can be seen framed in colour and seen as a poster, street sign, abstract artwork or AR marker. The woman peering at the screen works in the shop across the street and has been wondering as to its meaning for the past two days, now sees it decoded via a mobile device as people activate the marker. Typically, the first level of meaning for fiducial markers is as human-readable signs.

However, the function of a fiducial marker is to identify a location in space to a machine. The player points their device at the marker and it scans it so that it can provide contextual information. It shifts from being virtual—as a portal to a possible reality—to actual, as that portal is activated by a machine that responds with digital image and sound. The sign on the street made of acrylic and plywood is virtual; the data on the screen and resonating

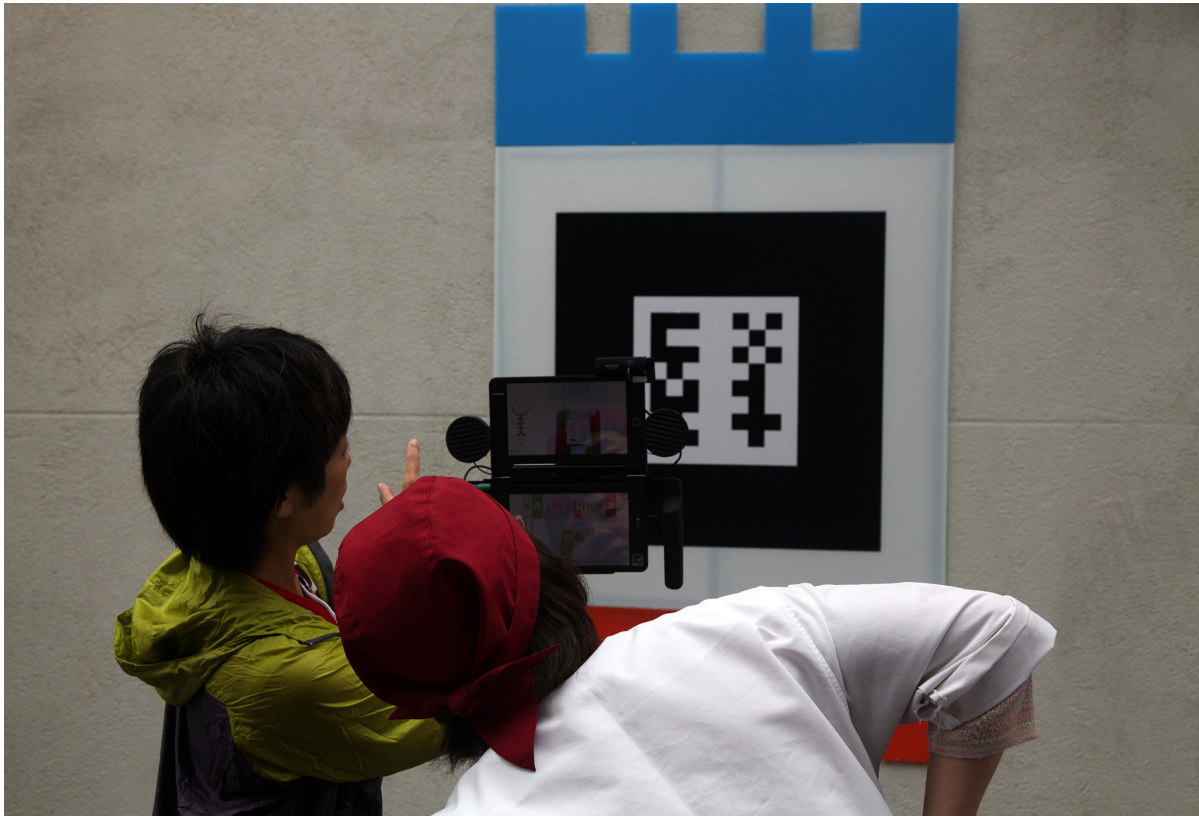


figure 5.

through the speakers of the device is actual. The mixed reality stored within the machine is activated and shared with the player or players within the space of the city. The device knows where and when it is located and this information provides points of contact between the two realities: the digital space within the device and the urban space of the city.

These games are ways for the Micronation of Ludea to engage in relations with other states. Its players are population, the rules of the game constitute its government, and through the act of urban codemaking it lays claim to territory. It is a poetic experiment in imaging other ways of being, and the roles of play in shaping our relations with the world—particularly play in mixed realities. Through ludic action in public space the potential for enabling adaptation to global environment change is possible by constructing new spaces via micronations that use new rule sets and codes of behaviour for human and non-human objects. Through play we create a new culture.



## Conclusion

This is a positioning paper, exploring a number of ideas about play in mixed realities and how this relates to our understanding of the Anthropocene. The altered perspective offered by this experience points to a different set of relations with the world, and a different mindset as a player. This is significant because play has an important role in the formation of culture. Culture needs to evolve to survive the negative aspects of the Anthropocene.

The role of play in cultural production is a central theme of the Micronation of Ludea, which proposes a theoretical experiment—a society ruled by systems of play. This is a poetic expression of contemporary developments in the developed world, in which players already engage with reality, particularly the mixed realities of cities, in new ways both mentally and physically. Some theoretical approaches to decoding this reality were presented, more work both in analysing existing games and systems is needed, and perhaps more importantly, creating further experimental game projects.

Most useful in decoding these processes are the redefinition of the ‘virtual’ (Lévy, 1998), unit operations—particularly within the context of alien phenomenology (Bogost, 2008; Bogost, 2012), and object-orientated ontology (Harman, 2011). In particular, two aspects of the quadruple object offer opportunities for further exploration in this context: the exploration of flattened, inclusive ontologies perhaps expanding urban codemaking into a form of urban ontography; and the decoding of fiducial markers and other game tokens present in cities in terms of their real and sensual qualities. This second aspect could subsequently reveal forces at play within urban spaces that recontextualise pervasive games in terms of holistic systems and processes within cities.

The role of the Micronation of Ludea is both to ‘locate’ mixed realities and crossmedia ecologies—to make them tangible—and as catalyst for ludic action in public space. It is a framework for participation in the formation and discovery of an ontological view of mixed realities. Via acts of urban codemaking and the use of the ‘noemaflux’ device, these worlds hidden in plain sight become visible through play. Although a fledging prototype of a micronation, it points to potential future spaces for exploration.

Pervasive and physical games are gaining popularity with festivals, events, and designers dedicating time and resources to their construction. Some of these reinvent existing

games, others link back to the ‘new games movement’, and as demonstrated by the history of playgrounds, many of these ideas predate the more recent video and digital gaming booms of recent times. Play, and play integrated with public space, has been a significant part of urban culture for more than a decade. Urban spaces, although increasingly ambitious, are about to reach their limits of growth. Games may help provide a solution to the problems presented by this, or at the very least a useful distraction. Watch this space.

## Biographical Note

Dr Troy Innocent is Discipline Leader (Games and Interactivity) at Swinburne University of Technology. His practice-led research invites people to play in worlds that emerge from transmedia ecologies—complex systems of virtual and actual signs and entities. He has exhibited and participated in international festivals, exhibition and symposia including Ars Electronica in 1992 and 2004. Innocent’s recent public art practice manifests in mixed realities, such as an interactive sculpture garden entitled Colony (2008), Urban Codemakers (2010), and noemaflux, an ongoing work that has appeared on the streets of Ogaki, Istanbul, and Adelaide. Innocent is represented by Hugo Michell Gallery.

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## FCJ-176 A Skeuomorphic Cinema: Film Form, Content and Criticism in the 'Post-Analogue' Era

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### Abstract:

Adopting an archaeological approach to digital cinema that helps us to recognise both the old in the new, and the new in the old, this article argues that a 'skewed' critical concept of the 'skeuomorph' can help us move beyond notions of remediation, convergence, and simulacra to better understand the complex entanglement of the familiar and the novel that currently defines contemporary cinematic form, content, and criticism. Using different examples to make our case, we maintain that audiences and filmmakers alike have not yet fully adapted to best read or understand the newly emerging digital forms, and are thus consequentially 'not quite seeing them for what they are, and always unconsciously trying to understand them in terms of the old and familiar' (Gessler 1998). By drawing attention to several contemporary blind spots, our detoured notion of the skeuomorph aims to make the new and novel features of digital film palpable.

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*In like manner a beginner who has learnt a new language always translates it back into his mother tongue, but he has assimilated the spirit of the new language and can freely express himself in it only when he finds his way in it without recalling the old and forgets his native tongue in the use of the new.*  
(Karl Marx, 2000: 327)

In this essay we utilise a ‘digitally detoured’ notion of the ‘skeuomorph’ to better understand the ‘gaseous’ form and content of contemporary cinema, arguing in particular that this concept entails various nuances that make it a more fecund framework through which to consider the aesthetics of digital cinema. Looking in particular at digital cinematography and performance, we argue that because of its emphasis on concealed and/or misunderstood novelty, the skeuomorphic framework yields a more productive understanding of digital cinema than do other terms such as simulation (Baudrillard 1994), remediation (Bolter and Grusin 2000), and convergence (Jenkins 2007), which are characterised by their focus upon ‘pastness.’ Against these, we embrace a ‘skewed’ approach to contemporary cinematic artefacts and phenomena, which allows us to approach our various objects and loci of study obliquely, or side-on, so that we may perceive the complex entanglement of old and new, familiar and novel, pasts and future, bound up within the digitalization of modern cinema. Such an approach undoubtedly helps situate our project within a broader ‘archaeological’ approach to media, technologies, machines, techne, and dispositifs to be found in the works of scholars such as Walter Benjamin (2004), Gilbert Simondon (1958), Michel Serres and Bruno Latour (1995), Jean Baudrillard (2005), Michel Foucault (2002), Lev Manovich (2001, 2002), Mark B. N. Hansen (2004), Jussi Parikka and Erkki Huhtamo (Parikka 2010, 2012, Huhtamo and Parikka 2011), and Boris Groys (2014) amongst many others.

Like many of these forbearers, we too recognize archaeology as an art and practice that is always-already about the present; particularly as we aim here to tease out the old features lurking within the new, as well as the new features waiting to be re-discovered within the old. In taking inspiration from thinkers like Deleuze, Guattari, and Parikka, however, we also seek to pervert and to modify that which is nearest and furthest away, in order to reveal some of the untapped novelties, and futural becomings (or unbecomings) already apparent or latent within our present film technologies and practices. As such, the present project also necessarily departs from many of the aforementioned practitioners and their methodologies, particularly by foregrounding a ‘skewed’ and ‘skeuomorphic’ nature to contemporary filmmaking, films and scholarship—which we maintain can better account for the parallelism of past and future (qua actual and virtual) concomitantly operating within digital cinema and film going.

## What is a skeuomorph?

The etymology of ‘*Skeu*’ stems from the Greek for vessel or implement. Anthropologist Nicholas Gessler thus defines a skeuomorph as an ‘element of design or structure that serves little or no purpose in the artifact fashioned from the new material but [which] was essential to the object made from the original material’ (Gessler, 1998). In other words, a skeuomorph is an object or form that anachronistically retains ornamental features or design cues from an earlier technological era or method of production—and which no longer have any functional purpose. Accordingly, skeuomorphs can be understood as ‘material metaphors instantiated through our technologies in artifacts’ that either light our paths by providing ‘familiar cues to an unfamiliar domain,’ or else serve to ‘lead us astray’ (Gessler, 1998). According to Gessler, when ‘yesterday’s functional features become today’s stylistic decorations,’ they either begin to constitute a special class of ‘self-deception,’ or offer a path into the new and unfamiliar (which, for Gessler, is better than no path at all). In this sense, the skeuomorph as a concept should be understood as being simultaneously deceptive and helpful.

We encounter examples of skeuomorphic design everywhere in our daily lives—as a stroll down any UK high street will amply demonstrate. For example, the modern bollard designs used to striate crowd or traffic movement retain skeuomorphic traces of a post-Napoleonic war design, wherein decommissioned or captured French cannons were cut and mounted with cannon balls in the street. There is no functional purpose for the modern design preference for a tapered cylindrical body and ball-top for a bollard, and yet they persist, for this is what bollards originally looked like. Passing a couple taking a photograph with a digital camera, we hear a shutter sound, an effect introduced via a digital clip when the button is activated, and which skeuomorphically mirrors the click of the shutter on older, analogue cameras. A car parked opposite displays a faux-walnut veneer on its plastic dashboard. And beyond that, a boat moored at the quay is proudly ornamented with fiberglass-ribbed planking made to look like wood.

Each of these skeuomorphs exists for different reasons. In time the bollard came to be a tool for controlling the direction of human and vehicular traffic; and while its design is today skeuomorphic, in that it need not be shaped in the way that it is, it perhaps retains elements of functionality because its dimensions and density are useful in discouraging drivers of modern cars who might otherwise drive over/through more flimsy equivalents. The digital camera’s shutter is not a necessity, but the sound cue enables both the photographer and their subjects (particularly if they are human) to know that the photograph has been taken (and that they can stop saying ‘cheese’). For diverse reasons,

then, we can recognise that skeuomorphs are common—including in the form and content of contemporary digital cinema.

As indicated earlier however, we are necessarily detouring the ‘everyday’ understanding of the skeuomorph in this outing to help concurrently account for the novel and new dimensions that arrive courtesy of new technological formulations. Thus, we aim to expand and modify the Greek prefix ‘*skeuo*’ to simultaneously house, or become possessed by, a modern (near homophonic) notion of skewed-ness; with this at once referring to the side-on orientation and approach we adopt towards our objects of study, and the skewed or oblique path that new skeuomorph machines forge into the unknown. Indeed, we might recall that, mathematically speaking, the term skewed means neither to run parallel nor to intersect, whilst in everyday parlance the term may also be applied to a part that diverges. As such, this concept allows us to approach our objects of study in a skewed chronopolitical and pragmatic manner, so that we may bring the past and the future into our peripheral vision, and simultaneously account for both the familiarity (pastness) and novelty (futura) of these technologies. Accordingly, our modified and doubly articulated notion of the skewed/skeuo offers an oblique polychronic enframing of our different objects of study, and makes palpable the latent futural dimensions or new territories opened up by their morphological evolution. Which is to say, a futural pole or dimension entirely lacking in many other approaches, including Baudrillard’s notion of simulacra, which is laden with the baggage of a pastness reworked in the present, or Michel Serres and Bruno Latour’s concept of the temporal foldings, or hidden ‘pleats of time’ in-folded into the latest technologies, making them appear contemporary only by assemblage.

To understand the different possibilities that arrive courtesy of our concept, we can briefly return to and update Serres’ famous example of the late model car. Indeed, today’s latest production line vehicle should be understood as an ensemble of different technologies and techniques that are contingently drawn together from, amongst many others, technologies emerging from or developed within Neolithic times (the wheel), the Nineteenth century (the combustion engine), the Twentieth century (the Air Conditioning Unit), and our own digital era (ABS and GPS); which is not to mention all the other sublimated and ‘forgotten’ historical technologies and techniques needed to extract and refine metals, build roads, vulcanise rubber, mould plastics and extract fossil fuels, which likewise become folded into today’s latest mechanised marketable assemblages. However, none of these past pleated features is necessarily simulacral or skeuomorphic. For the car’s wheels remain round because this is the optimal shape for driving, and not because they are familiar material metaphors for earlier wooden chariot or cart wheels. The ‘concrete’ combustion engine under the hood is likewise an evolution of its abstract forebears, rather than a skeuomorphic modulation thereof (see Simondon 1958).

In the following sections we hope to emphasise the often overlooked novel aspects of digital cinema by shedding light on why the paradigm shift engendered in cinema by digital technology—from actual to virtual, analogue to digital, object to simulation, humanist to post-humanist—has not yet appeared to be as radically transformative as typically promised. Indeed, many of the skeuomorphic features that contemporary digital cinema retains/displays highlight the aetiological or atavistic link between digital cinema and its twentieth century, analogue predecessor; these links being for reasons of ‘fashion’ rather than ‘function’. However, for this very reason, the skeuomorphic features of digital cinema are also deceptive in that they disguise the true nature and power of this precisely new medium as they diverge and diversify. We believe, therefore, that audiences and filmmakers have not yet learned fully to read or understand the newly emerging forms, and as a result, audiences and filmmakers encountering digital forms are still ‘not quite seeing them for what they are, and always unconsciously trying to understand them in terms of the old and familiar’ (Gessler, 1998).

In the following sections, then, we compare and contrast the ‘humanist’ features of twentieth century narrative cinema with their skeuomorphic guises in newer digital forms of films and filmmaking (terms with their own skeuomorphic implications). We shall therefore consider the role of the camera and camera effects, editing, and finally actors and acting as they appear in pre- and post-digital cinema, highlighting where and when skeuomorphic trends most overtly appear. We also attempt to keep one eye on theory and criticism, highlighting how it, too, is guilty of rhetorical anachronisms, and should increasingly strive to create more relevant skeuomorphic neologisms that better address, and adequately discuss, the reality of these new forms (or else account for their loosening shackles from older technological objects and production processes). Before looking at examples of cinematic skeuomorphs, though, we should contrast the skeuomorph with other concepts used to define digital cinema, including simulation and remediation.

## Simulation, remediation, novelty

Jean Baudrillard (1994) has perhaps written most memorably about simulation, defining contemporaneity as being dominated by symbols and signs that have themselves ‘preceded’ reality. Digital images in cinema often simulate analogue photographs in terms of both form (framing and the retention of rectilinear perspective in particular) and content (objects that have what Stephen Prince (1996) would term a ‘perceptual realism’). The examples that we shall give of skeuomorphic moments in cinema can also be read as simulations that function, in the Baudrillardian sense, as signs or symbols, particularly

as signs of high production values, which in turn supposedly increases the probability of a film's profitability. However, simulation's emphasis on signs and symbols lends to the concept a sense of 'pastness' away from which we would like to move. That is, signs and symbols are by definition familiar to us, in that we know already the 'meanings' that they signify or symbolise. The 'precession of simulacra' that Baudrillard defines, then, is the process of inhabiting an increasingly legible world in which everything always already has an a priori meaning (see Baudrillard, 1994: 1–42). [\[1\]](#)

The element of pastness that characterises simulation also infiltrates the concept of remediation, as devised by Jay David Bolter and Richard Grusin (2000). In *Remediation*, Bolter and Grusin argue that all media (and not uniquely the contemporary digital media that are often (still!) referred to as 'new media') 'remediate' older media. That is, they consciously appropriate the forms of older media. With regard to cinema, they suggest that remediation is also a form of hypermediation; our belief that the dinosaurs in *Jurassic Park* (Steven Spielberg, USA, 1993) are realistic is based not upon our having actually seen a dinosaur against which we could measure the film's creatures, but against previous, mediated dinosaurs that we have seen in other films, television shows, comic books and drawings. [\[2\]](#) In other words, we understand media through other media, hence 'new media' having a 'double logic' of hypermediacy and remediation (see Bolter and Grusin, 2000: 147–158).

Grusin has gone on to argue that in addition to remediation, cinema in particular also functions via 'premediation' (2004). This does not mean that cinema simply predicts the future (whether or not it does so accurately), but it does mean that cinematic visions of the future help us a priori to understand the future: 'the future is remediated before it even happens... [and] the future is remediated at the very moment that it emerges into the present' (Grusin, 2004: 29). In other words, films like *Strange Days* (Kathryn Bigelow, USA, 1995) and *Minority Report* (Steven Spielberg, USA, 2002) function as a form of premediation by not only depicting future media technologies as remediations of current/past media technologies, but they also provide us with a means to understand the future, such that catastrophes such as the destruction of New York's World Trade Center in 2001, when they do happen, 'never catch us unawares' (Grusin 2004: 36). [\[3\]](#)

Like simulation, remediation and premediation are important and useful concepts for understanding digital cinema, but the element of 'pastness' involved in remediation tends to negate precisely what might be new about new media technologies. That is, new media technologies, with digital cinema here as our focus, might well simulate and/or remediate old(er) media technologies, but this does not mean that their novelty consists uniquely in their ability to remix what already exists. In other words, we contend that there is novelty in

digital cinema—and the concept of the skeuomorph helps to make this clear, because while skeuomorphic designs are understood consciously or unconsciously to make the new feel familiar or comfortable (at least initially), the skeuomorph also affirms positively that there is something ‘new’.

Cognitively speaking, humans at birth are exposed to sights – if not necessarily sounds (there is sound in the womb) – that are new to them, but which they quickly learn to recognise. Given that humans, as a supersaturated species once acculturated to the ‘songs’ and ‘rhythms’ of their highly technological environments, communicate with others and machines not just linguistically but also functionally – that is, by picking out the salient qualities of the world that surrounds us in a fashion similar to our peers/conspecifics – we could argue that perception itself is a matter of remediation. In her ‘schizoanalysis of contemporary screen culture’, Patricia Pisters argues that in our current era of ‘perception 2.0’, the proliferation of digital screens and images surrounding us formulate the external brains to and with which human brains naturally connect and nerve (Pisters, 2012: 305). Taking inspiration from Gilles Deleuze’s thinking about cinema, and updating his concepts to better account for our contemporary era, Pisters argues that the feature of the digital neuro-image that becomes most unusual is its positing a form of thinking from the future. Indeed, Pisters argues that ‘[i]f the movement-image is founded in the first synthesis of time of the present, and the time-image is grounded in the second synthesis of the past, the neuro-image belongs to the third synthesis of time, the time of the future’ (Pisters 2013: 303). From this vantage, both past and present become dimensions of ‘the (always speculative) future, with the third synthesis of time becoming ‘related to the creation of the new, to hope for the future, an eternal recurrence of “difference,” but also to death (death as the future for all of us, but a future that also calls for rebeginnings)’ (Pisters 2013: 304).

Briefly to touch upon wider discourses of difference and repetition, which are relevant but which we do not have space to investigate in depth here, we know that there is not just repetition. If there were only repetition, the world would itself become blinding, or invisible, because if everything were the same/repeated endlessly we would exist in a disorientating/disorientated *ganzfeld* in which we would be incapable of telling one thing apart from another. In the spirit of Deleuze and Friedrich Nietzsche, then, we would say that there is difference, and that the extension of difference manifests itself as novelty, even if we can only recognise difference through the support of repetition. In other words, when we say that digital cinema is novel, we acknowledge that our recognition of its novelty relies in certain respects on a kind of cognitive remediation. But where Grusin (and Bolter) do not look beyond re- or pre-mediation and at the novel itself, the skeuomorph hopefully allows us to push beyond simulation of pastness and to encounter a novel third synthesis of time qua a thinking from the future which is also immanently and virtually bound up within present digital technologies.

## Cinema as old or new medium?

In addition to Bolter and Grusin's work on 'remediation', Lev Manovich has written about how digital cinema is in certain respects 'an old medium [passing itself off] as [a] new medium' (Manovich, 2002), while Jan Simons has discussed cinema as a 'new medium as old medium' (Simons, 2002). That is, Manovich says that digital special effects films 'aim to show us something extraordinary: something we have never seen before,' while both digital special effects films and films shot on digital video (DV) show us 'familiar reality in a new way' (Manovich, 2002: 212). However, while this may be their aim, 'the aesthetics of special effects and DV realism... are not new in cinema history' (Manovich, 2002: 217), in that both special effects and documentary-style realism have existed simultaneously since the earliest Lumière brothers' films. Writing in the era before cloud computing, Manovich argues that digital cinema is, therefore, both new and not, with cinema only truly destined to become 'new' when the unprecedented storage capacity of computers becomes utilised, and when users can 'interface' with all of the cinema uploaded on to these memory devices in novel ways (Manovich, 2002: 217). In our present era of prosumer slash-fiction, mash-ups, movie memes and fansubbing, it appears we have indeed taken one step closer to this reality.

Meanwhile, Simons argues that new media themselves do not necessarily remediate their predecessors, because '[n]ew media may simply not have been designed with such a purpose in mind' (Simons, 2002: 240). Simons also proposes that we recognise the metaphorical nature of the conceptual frameworks that we use to theorise films. This latter point is perhaps particularly useful, in that the skeuomorph is, with regard to film theory, a novel concept, but it is also a metaphor. The skeuomorph is not the perfect definition of digital cinema, but it functions as a lens to bring out what we perceive as the novel and, in accordance with Simons, the non-remediated aspects of digital cinema, even if these also follow on from the aesthetic traditions that Manovich identifies, and even if these persist within a cinematic institution that relies upon the traditional spectatorial model that Manovich seeks to overthrow.

Simons goes on to declare that digital cinema is neither a 'new medium as old medium,' nor an 'old medium as new medium,' but quite simply 'a new medium, bringing forth correspondingly new practices and new forms' (Simons, 2007: 51). With regard to special effects films, Chuck Tryon seems to concur with Manovich when he argues that 'the newness of special effects is recycled, reworked, and revisited' (Tryon, 2009: 39). In other words, we ought to recognise that discourses of the novel, together with concomitant backlashes against precisely the novelty of the effects that we see (Tryon, for example, highlights digital's continuities with, rather than its break from, analogue cinema; see Tryon,



2009: 171), have characterised much work in film studies over the last twenty years with regard to the digital and its effects on film. And yet, like Simons, we feel that digital cinema is (or was) new (even if we still refer to it—or remediate it—as, precisely, cinema, an ‘old(er)’ medium). Let us look, then, at how this is so.

## From cameras to Skeuo-cam devices

Paleontologically speaking, and as many ‘media archaeologists’ have demonstrated (see Huhtamo and Parikka 2011), the evolution of the movie camera is long and complex, involving the assemblage and refinement of various technologies. These include the camera obscura, the camera lucida, the heliographic techniques of Nicéphore Niépce, William Henry Fox Talbot and Louis Daguerre, pre-cinematic forms of animation or light show, the proto-cinematic (photographic) experiments of Étienne-Jules Marey and Eadweard Muybridge, and the changing cinematic inventions (amongst countless others) that have taken place since Thomas Edison and Auguste and Louis Lumière respectively began to make films.

However, we can outline the movie camera as a ‘black box’ or technological device that mechanically feeds strips of photosensitive film through its apparatus to capture a series of still, indexical photographs. These motion cameras necessarily employ optical lens technology, fashioned through smoothed glass (after the biological precursors found in animal eyes), which serve toprehend, refract or transmit light into the darkened camera chamber where it is focused on to a mobile recording surface that advances several times/frames a second. This recording surface is typically composed of a thin layer of photo-sensitive chemical mounted on to strips of film stock (originally celluloid, but later polyester), which are subsequently processed and set to produce negatives (a footprint), and then turned into positives (or a cast) for the purposes of projection.

Early camera equipment was necessarily bulky and immobile, limited to framing only the objects or scenes set in front of its monocular gaze. Throughout the Twentieth century, however, cameras became ever smaller and more mobile, with mechanical automation replacing the original hand-cranked film advancement system. Film stock itself developed sprockets for a more smooth mechanical advancement, and reels gradually became longer (and wider) and able to capture images for greater periods of time. By the late 1920s, film stock also began to capture sound, which, after much experimentation, was eventually recorded on to a magnetic strip running along the film’s periphery. Concomitant to these technological developments were ever-new ‘languages’ or modes of cinematic expression.



With the development of lighter, more mobile cameras, for instance, came dolly techniques, hand-held shots, and the aesthetic of the Steadicam; and, latterly, SnorriCam tropes (shots taken with a camera attached to the actor).

Although by no means exhaustive, this brief history sketches out the main material/technological features of twentieth century ‘mechanical movie cameras’ with which we wish to engage here. However, while the beginning of the twentieth century witnessed the birth of mechanical movie cameras, as Barbara Creed argues, the end ultimately witnessed its death, at the point where digital and virtual cameras began to appear (Creed, 2000: 79). Similarly, for Manovich, the advent of digital cinema served to mark a paradigmatic shift from the predominantly indexical legacy of the kino-eye, to the new age of the kino-brush, which is more akin to animation, or ‘painting in time’ (Manovich, 2001: 302). Parikka takes issue with the metaphor of painting, however, particularly as the digital media moves us away from ‘the gesturality of the painter, the hand and the use of colours on canvas’ and more precisely belongs to a ‘culture of coding and encoding colour intensities in a gridded pixel space’ (Parikka 2012: 36). In his rendering of the same shift from an era of ocular-centrism to a new era of the embodied ‘viewing’ (and feeling) of digital images, Thomas Elsaesser (2008) suggests that the new digital era accordingly presents itself as a heuristic event, or a Foucauldian dispositif, which allows us to ‘reflect upon one’s present understanding of both film history and cinema theory’ (Elsaesser, 2008: 232; quoted in Parikka, 2012: 22). What interests us here, though, is the manner in which this technological death or transubstantiation is initially (and still) disavowed, and how newly emerging digital forms skeuomorphically refuse, at least initially, to drop the design features of the earlier models, albeit whilst forging forwards into new, uncharted territories. We shall examine this issue by turning our attention to a recent film marketed as being the most advanced technologically in cinema history, *Avatar* (James Cameron, USA, 2009).

As is perhaps already well known, *Avatar* was made using a whole raft of expensive/experimental technological innovations and hybrid techniques, yet none appear more technologically skeuomorphic than the device James Cameron used for ‘shooting’ the film in/on ‘location’ inside a huge green screen stage platform, known as ‘the volume’. Cameron was seen (and shown in countless publicity images) to retain the use of a physical camera-like ‘recording’ device for most of the film’s shooting. Cinefex reporter Jody Duncan points out how a team at Technoprops had assumed that Cameron—as a twentieth century director—would be most comfortable with a camera device that ‘seemed familiar’ (Duncan, 2010: 86). Thus, virtual-production supervisor Glenn Derry was challenged to design a device that ‘would look and handle much like a typical motion picture camera, complete with tubular eyepiece’ (Duncan, 2010: 86). This prop-device, referred to as a ‘swing-cam’ (Thompson, 2010) or a ‘simulcam’ (Duncan, 2010), displays and records digital objects and environments rather than the actual reality (seen by humans) before it. By recording images

that are not before the swing-cam, the object appears ontologically distinct from previous models of photographic movie cameras, which relied on profilmic material in order to function. Skeuomorphically, however, we continue to conceive of the swing-cam through the vocabulary, design and functionality of traditional, analogue cameras.

This skeuomorphic object in certain respects only bears a superficial resemblance to an analogue camera, being a 'somewhat camera-shaped object' replete with a digital interface that can stream real-time motion capture and map it on to digital characters within their digital environments (Duncan, 2010: 86). Cameron dubbed this skeuo-cam device the 'swing-cam' due to its attached screen's ability to swing to any angle, thereby granting operators a greater (unlimited) freedom of movement (Thompson 2010). Although Cameron would point the swing-cam at his actors (who would be wearing Motion Capture suits on a green screen sound stage), much like he would were he shooting on location or in a studio, there the similarity between this skeuo-cam and the analogue cameras ends. For, as Anne Thompson illustrates, the swing-cam has no lens, but rather 'an LCD screen and markers that record its position and orientation within the volume relative to the actors' (Thompson, 2010). The position information built into the camera, like a modern GPS system, 'is then run through an effects switcher, which feeds back low-resolution CG versions of both the actors and the environment of Pandora to the swing-cam's screen in real time' (Thompson, 2010). By pointing this skeuo-cam object at Sigourney Weaver, say, Cameron could look into the eyepiece and see 'a videogame version of the avatar character, in real time, moving and acting as another being' (Thompson, 2010). Furthermore, as he moved the camera-object's 'recording end' around the stage, his viewfinder would present not a visual image of the stage, but rather the fictive digital world that the characters were supposed to be in (Duncan, 2010: 75). We have here, then, a complete reversal of traditional filmmaking: rather than build a set or find a location through which the camera then moves, Cameron instead moves his camera through low-definition images that are then made into high-definition images for the finished film.

What is more, the swing-cam also allowed Cameron to shoot a scene by moving through the volume, so that he 'could either pick up the camera and shoot actors photographically, as the performance occurred, or he could reshoot any scene by walking through the empty soundstage with the device after the actors were gone, capturing different camera angles as the scene replayed' (Thompson, 2010). In this sense, the swing-cam retains a three dimensional volumetric 'memory' of all movements within a digitally composited space, along with an infinite number of virtual views and vectors thereof (from all possible vantage points, including those impossible for humans to access unaided). In this way, multiple alignments and perspectives can be tried, tested, rejected and re-explored hours, days, weeks or even years after recording and acting are completed. The skeuomorphic dimensions of the technological object thus point to both a real and mediated dimension,

as well as a past and futural pole. Indeed, the familiarity of the object in its simulation of past technological artefacts is here counterbalanced by the introduction of a range of novel features that were not anticipated or remediated in the older form. The swing-cam thus becomes a camera-like object (a skeuo-cam) that boasts a fluid and continuous memory of recorded movement and action from within a supersaturated software-rendered volume.

The skeuo-cam also allowed Cameron to synthesise a variety of other ancillary cinematic techniques, which transcend the capabilities of all previous camera forms in radically new ways. Derry describes this new camera-object as a form of digital 'interface', feeding directly into a digital program known as MotionBuilder. He further outlines how this interface granted Cameron 'the ability to scale things, to fly around, to do everything a camera operator would do', such as zoom, replicate camera moves (like a dolly or crane shot), or even perform 'scale variations' from the microscopic to the macroscopic. In this manner, the operator can perform huge crane moves by adjusting 'the scale' of the view and moving the material-object with their hands. Derry explains how this offers the operator an ability to start a scene 1,000 metres above the diegetic world, 'and arrive at a close-up, say, at the exact moment an actor/character delivered a line' (quoted in Duncan, 2010: 86).

In other words, as per our brief discussion of cameras earlier, the technological developments involving the 'swing-cam' bring with them aesthetic possibilities heretofore impossible outside of (non-photorealistic) animation. If film history has been characterised by increasing the mobility of the camera, as well as by the possibility of recording for longer, now camera movement is entirely unconstrained, as are the time limits on shot duration. In part this is because there is no longer a physical camera needed for the making of a film like *Avatar*; the 'swing-cam' skeuomorphically resembles a camera, but in other, important, senses it is not a camera at all. Similarly, when a film cuts, it does so simply out of ongoing convention, and not, as per analogue cinema, out of necessity (as a result of a reel running out or the camera not being able to fit through a door). While Philip Rosen (2001: 331–332) is correct, therefore, to highlight how many filmmakers do not pursue the novel possibilities of digital cinema, in that digital cinema tends to look like analogue cinema, he also perhaps overlooks the very novelty that digital cinema does allow. Furthermore, while Boris Groys (2014) has offered a detailed analysis of how it is an old technique to promote the new, this does not mean that new things do not come into being. Ethically, we seek not to 'prefer' either the old or the new (see Groys, 2014: 7); we simply wish to identify that digital cinema does have novel aspects, and that we should recognise these (even if initially using 'old' frameworks) if we wish to understand it.

Various other visual effects and features visually hark back to the analogue era in a skeuomorphic fashion that recalls the physical reality of hand-held cameras, glass lenses and film stock. In *Beowulf* (Robert Zemeckis, USA, 2007), for example, many of the battle scenes employ a form of ‘hand-held shot’ that appears to invoke a humanist aesthetic: slight ‘camera shakes’ suggest the immediacy and authenticity of a human observer/operator, as per the (predominantly) analogue battle scenes of films like *Braveheart* (Mel Gibson, USA, 1995). Other camera ‘effects’ retain features that appear linked to a ‘surplus’ of information originally ‘captured’ by the older kino-eye technology. Lens flare, or the effects of direct sunlight shining through the glass lens of a camera is one example of such a surplus feature. The gathering of rain droplets, or blood, upon the camera’s glass lens provide other notable examples. Even though made using ‘cameras’ that do not have lenses, moments from films like *Star Trek* (J.J. Abrams, USA, 2009) have faux lens flare added to various images, while water/blood splatterings are increasingly painted into the digital frame in a host of contemporary (predominantly blockbuster) movies. In other words, these effects are skeuomorphs that simulate a familiar ‘cinematic view’ of ‘recorded’ events.

While both simulations and remediations of analogue cinema, these skeuomorphic moments also point to the novelty of digital cinema. Implicit in skeuomorphic moments, this novelty becomes explicit during the rain of ash that falls following the destruction of the Home Tree in *Avatar* and the falling snow sequences of *A Christmas Carol* (Robert Zemeckis, USA, 2009). In these examples, the lack of a lens on the digital ‘camera’ (and the lack of a screen border invoked by Digital 3D (D3D) projection (for a consideration of this, see Purse, 2013: 134–149) allows atmospheric information to flow freely between skeuo-cam and recording surface, between diegesis and auditorium. Such effects are part of the new language of digital cinema, and do not skeuomorphically translate back into the traditional language of analogue cinema.

Skeuomorphs, then, can be understood as connoting a ‘cinematic’ authenticity, reality, or familiarity that helps build the path into the new. On account of such features, scholars like Scott McQuire and D.N. Rodowick argue that industrialised standards of photorealism remain the ‘holy grail’ for CGI effects within the digital age, with CGI being judged against a ‘camera reality’ rather than any objective realism (see McQuire, 1997: 5; Rodowick, 2007). Thus, many digital effects are not so much concerned with creating a perfect image, but rather of reproducing an anachronistic camera-like image. As discussed, these digital forms deliberately incorporate fake ‘flaws’ like edge halation, motion blur, and even grain to appear humanist (McQuire, 1997: 5). For Barbara Creed, these phenomena suggest that a century of watching cinematic images has resulted in a perceptual shift, such that the cinema-going public’s cultural point of reference has shifted from the real world to ‘cinematic’ representations thereof, which have become our common ground of

comparison (Creed, 2000: 85). If this is the case, then it is only natural that early forms of digital cinema would so slavishly fashion the new through skeuomorphs of the old, the comfortable and the familiar as it discovers and un-conceals new possibilities.

Beyond camera-objects and skeuo-cam effects, there also persists a rhetorical use of the term 'camera' within critical discourses to describe the vantage point or perspective from within the diegetic universe, where essentially there is/was no camera at all. As discussed, programmers and directors increasingly decide where to position virtual framing perspectives and to play with their respective scales from within the digitised volume. They do not, in this sense, use any actual camera (or skeuo-cam object). These forms of digital perspective, which are commonly used to frame the diegetic action within the digitally composited worlds of, say, *Shrek* (Andrew Adamson and Vicky Jenson, USA, 2001) and *Wall-E* (Andrew Stanton, USA, 2008), are completely virtual entities, formulating virtual axes/potential lines of sight within the volume of rendered digital space. Now, we may argue that animation has always done this – and it is not our intention to suggest otherwise. However, the digital filmmaker can play around with and modify her images with ease as she navigates the 3D space of the film's diegesis with the skeuo-cam, while the traditional animator would not be able to do this except mentally and/or with impossible amounts of labour involved.

Edward Branigan (2006) further problematises these issues in his book-length exploration into the different critical uses of the term 'camera' within traditional film theory and history. Drawing a distinction between the nature of film itself and the language used by theorists to describe its various manifestations, he shows how the term 'camera' is often polluted or used as a stand-in for different things such as 'a shot, image, frame, motion, motion picture, motivation, point of view, and narration' (2006: xiv). The critical use of the term is also often falsely anthropomorphised, imagined as an objective tool for observing a profilmic reality, or endowed with a subconscious of its own. The term camera is thus used as an aid to implant meaning into a film, fluctuating in a 'twilight area between material object and interpretive subject, between world and language' (Branigan, 2006: 96). Exploring eight different critical uses of the term camera, Branigan also exposes how theorists have traditionally employed descriptions of camera movements, framings and effects as linguistic metaphors for how a film focalises, scrutinises, draws attention to, signals, highlights, or else grants significance to objects or things. Building on similar objections, Daniel Frampton (2006) moves forward to advocate an altogether new conceptualisation and description of what he calls 'film-thinking' and 'film-thought' to better describe how a film invites viewers to see and think through sound and images. For us, irrespective of the confusing baggage picked up over a century of uses and misuses, the terminology increasingly appears as a critical skeuomorphic trend, and to continue discussing any view into a cinematic world as belonging to, or emanating from a 'camera' becomes less

acceptable. Contemporary discussions of cameras must thus be recognised for what they are, critically and academically familiar and rhetorically comfortable.

## Editing

In *Cinema 2*, Gilles Deleuze, after Robert Lapoujade, observes an aesthetic shift from montage to *montrage* in post-war cinema, which recalls André Bazin's predilection for the long takes and deep focus of Orson Welles and Jean Renoir over the montage cinema of Sergei M. Eisenstein (Deleuze, 2005: 40). In the post-war context, Deleuze observed that the new cinema was no longer defined by cuts, but rather continuity and showing ('montrer' in French). Pace David Bordwell (2006: 117–189), William Brown has argued that digital technology plays a key role in 'intensifying' the continuity/'montrage'/'monstrous' nature of contemporary cinema (Brown, 2009b). Elsewhere, we take this even further, introducing a Deleuze-inflected model of 'gaseous' virtual camera perception found in the digitally rendered filmic spaces of *Beowulf* (see Brown 2009b), *Fight Club* (David Fincher, USA, 1999) and *Enter the Void* (Gaspar Noé, France/Germany/Italy/Canada, 2009) (see Brown 2009a; Brown and Fleming 2011). Here, cinematic space and time are understood to be traversed and viewed by a purely digitally composited perspective, often marked by flowing perceptual passages 'through' psyche and physics (solid objects and the space between them). Again, such shots are not captured by any form of physical camera as we traditionally understand it.

In 'gaseous cinema', we argue, the free-form movement through digital time and space is marked by a conspicuous lack of cuts, and replaced by a continuous flowing mode of spatial and temporal perception. The skeuo-cam perspective offered in these filmic worlds increasingly becomes free to pass through memory and matter, time and space without recourse to any (apparent) cutting whatsoever. Although the option of using montage and/or continuity has long been available to filmmakers, the ability to pass through solid objects—in an unbroken flowing manner—is something both unique and effortless to new digital forms. In both *Fight Club* and *Enter the Void*, for instance, a virtual skeuo-cam is able to pass effortlessly through and into the human body, freely flowing into and out of a skull or uterus. These skeuo-cam moments also typically pass through solid walls and architecture that previously would have divided or segmented diegetic space (and require cutting to traverse). These gaseous perspectives also display an ability to change scale at will, to depict firing neurons within the human brain in *Fight Club*, or microscopic spermatozoa swimming up the fallopian tubes in *Enter the Void* during shots that later also feature, say, a whole human head that takes up as much of the frame as these other, 'microscopic' features. Furthermore, these films also seamlessly blend physics and psyche,



or gaseously pass through matter and memory/fantasy whilst actively refolding them as a single and continuous plane.

Admittedly, these tropes were often attempted within analogue films such as *Citizen Kane* (Orson Welles, USA, 1941) as is evidenced by the bravura takes that move through the neon lights outside the El Rancho bar and move ‘inside’ through the bar’s skylight via a dissolve. These particular ‘superhuman’ perspectives were only achieved by hiding the cut and editing shots together, but they were not always hidden well. In digital cinema, new modes of spatial and temporal passage are increasingly marked by an intensified speed and a seamless continuity, which ultimately renders editing and cutting an expressive choice rather than a technological necessity. That is, editing techniques retain their own unique powers and forms of cinematic thought/expression, with the dialectical style remaining a useful tool within the filmmaker’s toolbox. What is more, in its very nature, editing can express different, non-gaseous modes of perception. Stanley Kubrick’s most famous montage cut from *2001: A Space Odyssey* (UK/USA, 1968), for instance, elides 150,000 years of human evolution in a single cut from a prehistoric bone-tool to a satellite orbiting Earth – and is powerful exactly because it utilises a cut, or an aesthetic interstice that simultaneously elides two vastly distinct moments in time and signals an ellipsis of information. It is the cut itself that gives this particular form of cinematic expression its affect, and no digital morph could claim to offer the same power or to reflect the film’s themes as effectively – although films like *Russkiy kovcheg/Russian Ark* (Aleksandr Sokurov, Russia/Germany, 2002) do move through different time frames without a cut, as the film takes us from the era of Peter the Great to Catherine the Great to Nicholas and Alexandra and to the contemporary world in its 98-minute single-take duration. As *Russian Ark* implies, digital cinema retains cutting and editing as a skeuomorphic convention, which only hides the ‘gaseous’ spatial and temporal perception that digital technology can otherwise allow. The example of *Star Wars Episode One: The Phantom Menace* (George Lucas, USA, 1999) provides a good case in point here. Although Lucas ostensibly made this prequel using the latest (1999) technological and digital imaging devices, the form of the new film clearly echoes that of the earlier 1970s and 1980s trilogy, comprehensively conforming to their framing devices and cinematic grammar. In this sense, the more recent prequel films are guilty of translating new cinematic forms back into the familiar vocabulary of what Marx, in our prefatory quotation, might term the ‘mother tongue’, for purposes of continuity and familiarity. But we can extend this example beyond the Star Wars film cycle, and apply it to the digital film cycle more generally.

## Skeuomorphic Actors

Critical discourses surrounding the appearance and development of digital actors usually focus upon the extreme cases of what have become known as synthespians, cyberstars, or vactors (virtual actors). Here, however, we wish to engage with how traditional carbon-based actors and CGI have increasingly moved into a formal relation, whilst critical discourses persist in retaining skeuomorphic allusions to previous traditions (for ease and comfort), by regularly attributing performance to a single star or actor—even if this increasingly seems unjust if we look at and below the surface. In the digital age, the traditional conflation of actors with character (or more specifically, the concept of actors as individual singularities external to the film), should increasingly be revised so that actors are seen as contributors to an internal digital multiplicity, and viewed as collaborators who contribute certain skills to the realisation of the final character or role.

D.N. Rodowick views the new ‘cyborg fusions’ of actors and digital information—wherein CGI is increasingly used to efface and even rewrite the actor’s body—as a part-human and part-synthetic ‘Frankenstein hybrid’ (Rodowick, 2007: 8). We take Rodowick’s ‘hybrid’ even further, however, as we recognise the multiplicity’s ability to fluctuate and intensively change throughout narrative time. Like a swarm, the multiple as actor can be viewed as a single organism (the character), or as a collection of smaller contributors at different times or under different forms of observation. In other words, new forms of human-digital performer are best understood as a multiplicity or assemblage, which incorporates countless human parts (and human-hours), heterogeneous forces, and digital features. We thus believe that critics should, when relevant, discuss actors as contributors to new digital forms that constitute complex and multifaceted trans-human assemblages. Actors and stars in the digital age should accordingly no longer be synonymous with, nor held fully responsible for, the role’s final performance, no more than the director should be held fully responsible for everything that appears within the multiplicity of the film.

Here we wish to offer three key examples to illustrate our point: Andy Serkis’ contributions to Gollum in the *Lord of the Rings* films (Peter Jackson, New Zealand/USA, 2001–2003), Brad Pitt’s contributions to the eponymous hero of *The Curious Case of Benjamin Button* (David Fincher, USA, 2009), and Sam Worthington’s work within Jake Sully’s Na’vi double in *Avatar*.

As a starting point, we would like to engage with an exclusively digital technique increasingly popular for generating roles within digital cinema: Motion Capture, or MoCap. Stephen Keane describes ‘motion capture’ as a procedure designed to capture an actor’s



physical movements as a 'reference point' for a digitally rendered character (Keane, 2007: 156). This is usually achieved by the actor wearing a mono-coloured suit adorned with motion sensors that allow a computer to track and store the performance as pure digital information. From a posthuman perspective, actors are not so much filmed any more, as tracked in what L. Marshall (2007: 3) calls their 'computer pajamas' (see also Brown, 2009b: 162). Computers are thereafter used to translate the captured motion of the performance into digital code, which is only outputted in a visual format resembling human perception in post-production (Brown, 2009b: 161). These techniques are increasingly supplemented by 'facial' and 'e-motion' capture to give the character expressive capabilities, with the combination of the two techniques termed 'performance capture.' Keane offers the character of Gollum from the *Lord of the Rings* films as an example, describing him as a 'combination of elements' that move beyond motion capture and pure digital imagery. Serkis originally wore a MoCap suit to contribute his performance to the Gollum role, both with other actors and alone on a sound stage. Later, Serkis was visually removed from the film and replaced by an animated creature that retained a trace of his earlier kinetic performance. The visual design of the creature was carried out by artists and digital animators using Serkis' face as a reference point, but their various contributions also add to the overall feel and performative effect of the final character/role. Serkis can here best be understood as a form of analogue puppeteer behind the virtual Gollum, whose expressive capabilities are also assisted by digital animators in their own right (above and beyond Serkis' performance capabilities). For Keane, Gollum thus physically, technologically and emotionally provides an example of what he describes 'as a very layered performance' (Keane, 2007: 72–73).

It is important to bear in mind Mark J.P. Wolf's argument that performance has, through the use of body, stunt and hand doubles, make-up artists, and more, long since been a 'technological construction' (Wolf, 2003). Nonetheless, motion captured digital performance can 'still matter' in a posthuman cinema, especially if considered through the Deleuzian lens of the *geste*. The *geste* is Deleuze's term for 'elements that are irrelevant to the narrative construction of the cinematic depiction', and which allow viewers to see the body not as simply a part of a story, but as 'a living entity, despite any digital make-up, transformation, or extreme disregard for nature laws' (Hadjioannou, 2008: 135; see also Brown, 2009b; Fleming, 2012, 2013). From this perspective, the corporeality of a performance is reasserted in digital form so that the digital body becomes 'a role.' Thus, there remains room for a re-emphasis of the body as a performative or even affective-performative force in motion capture cinema because there remains a continuity in performance. Indeed, if one actor is employed for the capture, the continuous 'physicality' of their performance can be 're-foregrounded in a theatrical way' (Brown, 2009b: 162). This view is somewhat problematised by a film like *The Curious Case of Benjamin Button* however, since here multiple actors provide the character's body throughout the film, digital animators contribute to its 'performance', a film star provides the raw data for its

facial movements, and yet a single role or *geste* is maintained (Fleming, 2012: 200–208). Accordingly, the continuous role of Benjamin was not asserted through a continuous body performance or ‘theatrical’ role, but rather emerged through a variegated galaxy of different performances and technologies (including editing) composited from different times and spaces. And yet, although this new technological capability was highly publicised on the film’s release, many reviews unproblematically focused upon Pitt’s lead performance, overlooking the fact that the actual role of Benjamin was ‘performed’ by an assemblage of different body actors, computer technologies, and digital animators above and beyond Pitt’s facial-performance capture. This photo-real character that is born old and fated to grow younger (and eventually to lose his memory) here surfaces as a material metaphor for the fate of the cinematic actor in the digital age (see Fleming, 2012). That is, the actor is reborn and radically freed from the indexical ‘memory’ of recording cameras, and is now able to become more powerful and affective thanks to the skewed technological interface with other human and inhuman actors and actants (see Fleming, 2012).

Another filmic role that seemingly reflects upon this paradigm shift in acting and performance can be unearthed in the Na’vi creatures of *Avatar*, which diegetically and extra-diegetically formulate a synthesis of computer technologies and human DNA. Jake Sully’s Na’vi avatar is a part-human, part-technological assemblage that seamlessly synthesises human, alien and digital technologies in a new and productive way. Extra-diegetically, over and above Worthington’s captured body movements, which invisibly interlace with the movements and actions of unseen stunt men and performance doubles, the Na’vi avatar also incorporates animation used to grant affective life to the creature’s expressive tail and other non-human physiognomy. The animators thus work with the captured human performance as raw data, adding to, and subtracting from the original performance as necessary in a bid to create a separate role. In this sense, a digital interface and multiple human performances (both actual and animated) also enter into the performative and affective assemblage.

For Daniel Frampton, digital animators become the new gods of the digital cinematic world, ‘able to show anything, be anything, go anywhere, think anything’ as well as perform in new ways that necessarily transgress the limitations of the all too human (Frampton, 2006: 205). Our conclusion here is that digital technology has taken cinema into the realm of the trans-human – even if we still consider these performances skeuomorphically to be carried out by a single actor, and even if most filmmakers still use these trans-human techniques to make films that claim to be about human characters. The logical extension of this, though, is the morph, in which we see a character change from one form to another before our very eyes – as happens in *The Lord of the Rings: The Fellowship of the Ring* when Bilbo Baggins (Ian Holm) sees the titular ring on the person of his nephew Frodo (Elijah

Wood), and transforms suddenly into a sharp-toothed demon as he reaches for it. As the depiction of space becomes 'gaseous', so, too, does the depiction of characters and the characters themselves. In short, then, many films are made according to the traditions and conventions that developed/emerged due to the limitations of the analogue technology used to make films (which is not to overlook industrial and economic factors and pressures, or the possibility that various analogue techniques may in fact capture viewers' attention in efficient, perhaps even 'natural' ways, as Brown has explored elsewhere (see Brown 2011). However, our argument here is that they need not be.

Drawing upon salient examples from Hollywood and other cinemas, we have proposed that on the level of cinematography, editing and performance, the traditional techniques—and the theoretical frameworks that we use to understand them—are retained in a manner that is both helpful (as are the concepts of remediation and simulation), but also deceptive. For, as per our *détournement* of the skeuomorph as a metaphor through which to understand digital cinema, these tendencies occult what is truly novel about cinema in the digital age. Namely, cinema is freed definitively from the camera whilst retaining perceptual realism; it is freed from the cut, even if it remains as a convention; and it explodes the concept of the actor into what Fleming (2012) characterises as a swarm or a galaxy of performing flesh and digital bodies. To evoke Marx once again, all that is solid has now melted into gaseous air. In this sense, while discourse surrounding digital cinema can either be evangelical or hyperbolic in its insistence upon the new, which in turn produces corrective, 'archaeological' arguments that point to the continuities between digital and analogue cinema, we would argue that the digital is skeuomorphic. That is, the retention of old techniques and conceptual frameworks is useful, but it also blinds us to what is truly novel about digital cinema.

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William Brown is a Senior Lecturer in Film at the University of Roehampton, London. He is the author of *Supercinema: Film-Philosophy for the Digital Age* (Berghahn, 2013), and, with Dina Iordanova and Leshu Torchin, of *Moving People, Moving Images: Cinema and Trafficking in the New Europe* (St Andrews Film Studies, 2010). He is also the editor, with David Martin-Jones, of *Deleuze and Film* (Edinburgh University Press, 2012). Furthermore, he has made a number of no- to low-budget feature films.

## Notes

[1] Simulation is of course a useful concept, and it does apply to our understanding of contemporary cinema, but perhaps only in its most extreme manifestation, as per Mark B. N. Hansen's Bergsonian take on digital imaging in Virtual Reality (VR). For Hansen, VR marks out a post-medium mutation of the analogue cinema. Thus, if historically photography and cinema were materially inscribed images (or indices) created for the 'subsequent perception by the spectator's simulated consciousness', digital VR becomes an advanced and doubly articulated form of simulated perception, wherein a digital simulation folds directly into a human consciousness/simulation (Hansen, 2014: 170).

[2] Various recent news reports have suggested that scientists increasingly believe dinosaurs to have been feathered. In other words, the lizard-like scales that the dinosaurs in Jurassic Park possess could in fact be unrealistic based on the best available evidence—even though the creatures are still upheld, not least for their convincing style of movement, as realistic computer-generated effects. See, inter alia, Gill (2010), Handwerk (2009) and Science Daily (2007).

[3] The logic of premediation perhaps reaches its apogee in conspiracy theories that believe films featuring alien invasions are 'preparing us' for an inevitable and imminent 'contact' with aliens and/or invasion. It is not that these conspiracy theories are worth taking seriously (we will be happy to eat our words if they turn out to be true). Rather, they demonstrate the way in which premediation extends beyond us, never being caught unawares to us, knowing already that we will never be caught unawares.

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## FCJ-177 Television Assemblages.

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### Abstract:

Television has become a multiplatform medium that houses content on a number of different sites and devices that encourage new forms of engagement. This new digital environment has transformed television from a closed system, where programmes are transmitted to a television set for viewers to tune into, to an open system that produces new television connections and configurations. Drawing on the work of Deleuze and Guattari, Latour and current media theorists, this essay turns to the concept of assemblages for theorising this new interactive multiplatform television environment. Thinking about multiplatform television through the concept of assemblages offers a means of exploring how television devices, texts and media are reconfigured or modified so as to display new functionalities and capacities. It also enables us to consider the way television culture can be deterritorialised and reterritorialised through new connections and in doing so introduce new qualities such as interactivity and reciprocal determination.

## Introduction

It is an understatement to say that television and television culture have undergone a dramatic transformation over the last decade. As little as ten years ago typical Australian viewers would sit in front of the television set at a particular time to watch their favourite show. If they wanted to record a programme they would have to go through an elaborate process which included: searching the scheduled programme time and then entering the start and end dates and times on a video recorder; rummaging for a free tape and making sure the video recorder was left on. Today, by contrast, viewers can access their favourite shows in a number of different ways, on a variety of platforms and devices, at a time of their choosing. New forms of digital television have emerged, including Internet television and IPTV, that offer new ways of accessing programmes and increasing personalisation and customisation practices. Internet TV includes new platforms such as Apple TV and Netflix that deliver programmes over the Internet. In the midst of this change at least three new and distinct functions stand out: pay per view, search and retrieve, and upload and share. With pay per view 'the consumer pays for the content package separately and in addition to, the broadband access package' (Barr, 2011: 60.1). Search and retrieve practices form the basis of watching television on a computer or using applications on mobile devices to download programmes or stream live television. Upload and share practices enable viewers to engage with a show's interactive material or create and distribute user generated content. These changes have transformed television from a single platform medium into an interactive multiplatform medium that encourages viewer (if this term is still appropriate) participation.

This new television landscape requires us to rethink how television functions socially and culturally. The emergence of digital, multiplatform television also puts into question many of the central concepts and theories for understanding television and television culture, such as: appointment viewing, mass audiences, liveness and broadcast-flow (Meikle and Young, 2008: 67–8). As a result of these changes some television theorists suggest that there is a need to develop new theoretical frameworks that encompass more than the analogue broadcast model. In the US context, Amanda Lotz argues that the shift to the digital multiplatform has altered television's industrial logic and therefore requires 'a fundamental reassessment' of how television 'operates as a cultural institution' (Lotz, 2007: 23). For Joke Hermes television and television viewing is so vastly different than it once was that 'we are in need of evaluating what television is about and, perhaps also, of updating our theoretical frame-work to understand the medium' (Hermes, 2013: 36). Contributing to the debate, Bennett and Strange have edited a collection of essays that attempt to 'form a new critical paradigm for thinking about television in the digital era' (2011: 7).

In his study of new forms of television, William Uricchio proposes that rather than thinking about television's recent transformation as unique, '[t]he history of television is a history of change' (Uricchio, 2013: 65). Judith Keilbach and Markus Stauff follow this line of thinking by stating, '[p]art of the 'power of television' lies in its constant transformation process, enforced by a continuous reflection on the 'appropriate' use and an ongoing redefinition of television' (Keilbach and Stauff, 2013: 80). Uricchio further argues that, as a medium television was only relatively stable between the years 1950 and 1980 and that in the long run this will be considered a blip in the history of television (Uricchio, 2013: 66). However, he also emphasises that the years of stability have had a great influence on the way we have theorised television. '[T]hey have helped to mask some of the medium's fundamental transformations, and they have continued to shape key assumptions about television's interactions with its audiences, whether on the part of the head-counters or some academics' (Uricchio, 2013: 66).

Keilbach and Stauff have a similar issue with the framing of television as a stable medium. They argue that recent discussions about the dramatic changes in television that 'distinguish the medium's current heterogeneity from television as it used to be ... [imply] that television once had a stable identity that is now being called into question' (Keilbach and Stauff, 2013: 79). By looking at a number of experiments over the history of television, Keilbach and Stauff conclude that change and transformation are not simply 'characteristics of the medium's current phase but more generally [are] one of television's integral features' (Keilbach and Stauff, 2013: 80).

One concept that shows promise for thinking through the new multiplatform television landscape is that of assemblages. As Goggin notes assemblage theory 'questions the constitution, production, and reproduction of the social, pointing to how particular objects suggest different conceptions, ordering and politics' (Goggin, 2009: 153). According to Goggin assemblage theory 'takes seriously the particular objects, technologies, and forms through which culture is brought together' (Goggin, 2009: 153). The goal of this paper is to explore the applicability or affordances of the assemblage for theorising multiplatform television. More specifically, in this paper I argue that the concept of assemblages provides a means of accounting for the formation of new kinds of connections between discrete devices, texts and applications, at times across different mediums. It enables us to think about how previous and current devices, texts and medium are reconfigured and adopt new functionalities or are modified, so as to display new qualities. The concept of assemblages takes into consideration the way television culture can be deterritorialised and reterritorialised, so that new functionalities and qualities are introduced. It also allows us to consider how agency is reshuffled, as new connections are formed between new kinds of devices, texts, practices and applications. Finally, the concept of assemblages shows promise in theorising multiplatform television as an arrangement that challenges

a linear determination based on a cause and effect logic, in favour of a multi-determinate trajectory. In this sense television and television culture is conceived as something that is constantly being reconfigured according to the introduction of new elements and components. This essay turns to assemblage theory because it specifically focuses on open and dynamic systems. However, it needs to be pointed out that within the scope of this essay, it is only possible to attempt a preliminary consideration of assemblage theory for understanding the social and cultural implications of multiplatform television.

This essay is divided into three sections. The first outlines assemblage theory and how it applies to the social. The second section examines two examples of multiplatform television in relation to assemblage theory. The first example focuses on the Foxtel's catch-up application Go and the second focuses on the LetsPlay YouTube channel Stampy. The third section applies some key aspects of assemblage theory to some recent changes in television and television culture. It also argues that the shift from broadcast television to multiplatform television signals a shift from a molar assemblage to a molecular one, and analyses what each of these approaches offer as well as what they limit.

## Section One: Assemblage Theory

Assemblage theory has many layers. The theorists that are mostly associated with assemblage theory are Gilles Deleuze, Bruno Latour and Manuel DeLanda. Each has their own particular understanding of assemblages and has developed the concept in different ways. The diversity of approaches can be understood as a response to the limitations of traditional social theory. As Latour argues, social theory privileges stability and tends to structure the social around fixed terms and binaries such as 'actor and system, or agency and structure' (Latour, 1999: 16). Social theory also finds it difficult to account for changes in the social that come about as new connections are formed, and how these potentially reformulate or transform the way the social is ordered or assembled. In traditional social theory, the social is understood as a closed system with a fixed set of parts that constantly relate to each other in a predicable way. Furthermore, the social does not connect with, or is not influenced by, anything outside its structure and set of relations. DeLanda makes a similar point in his critique of sociology's understanding of social structures as 'displaying an organic unity' or a 'seamless totality' with 'relations of interiority' (DeLanda, 2006: 9). Here, he says, all the parts of a structure are so reliant on each other and seamlessly fused together to form a whole, that they can only function within the structure. 'A part detached from such a whole ceases to be what it is, since being this particular part is one of its constitutive properties' (DeLanda, 2006: 9). In his work on organisations and social movements, human geographer Joris Van Wezemaal looks at the problems with this

understanding of the social. He states, “Structure” both in the natural and social sciences grounds determination within a logic of stability and linear causality. Although this mode of theorizing provides a basis for prediction and thus for intervention and rational governance, it falls short in accounting for change’ (Van Wezemael, 2008: 169). The implication of this is that social theory misses transformations in culture and the social itself.

Assemblage theory counters the idea of the social as a constantly stable structure. Deleuze, Latour and DeLanda have all taken their own path in developing the formal concept of assemblages. However, there are significant consistencies between them. Complicating matters is the fact that different theorists use different terminology to describe what might appear to be similar phenomena. For example, although he may be overstating the point, John Law argues, ‘there is little difference between Deleuze’s *agencement* (awkwardly translated as “assemblage” in English) and the term “actor network”... Both refer to the provisional assembly of productive, heterogeneous, and ... limited forms of ordering’ (Law, 2009: 145). Law also highlights the similarities between Latour and Deleuze by pointing out that ‘Latour has observed that we might talk of “actant rhizomes” rather than “actor networks”’ (Law, 2009: 145). Actants are entities that contribute something new to the assemblage and can be human or non-human. According to Latour they ‘...modify other actors through a series of trials’, or in other words a series of actions (Latour, 2004: 75). The term rhizome has a special status in the work of Deleuze and Guattari and Latour. Latour writes ‘the word network, like Deleuze’s and Guattari’s term rhizome, clearly meant a series of transformations—translations, transductions—which could not be captured by any of the traditional terms of social theory’ (Latour, 1999:15). In order to understand how this occurs it is necessary to examine the assemblage itself.

In broad terms, there are two types of assemblages: stratified and rhizomatic. This paper privileges a rhizomatic assemblage because it best describes the dynamic, interactive qualities and functions of multiplatform television. A stratified assemblage is based on a fixed structure with relatively homogeneous parts and is frequently called a molar assemblage. A rhizomatic assemblage, also called a molecular assemblage, is a relatively stable formation made up of heterogeneous components that include human as well as non-human elements. A rhizomatic assemblage also forms connections with new and disparate elements outside its arrangement, thereby introducing to the assemblage new qualities and capacities as well as change and transformation. In this sense, it is not that a rhizomatic assemblage is not a system, but rather what it is what Ronald Bogue describes as an open system (Bogue, 1996: 257). In addition, unlike relations of interiority the parts of the assemblage retain their unique properties even when they form new relations and become a part of another assemblage. DeLanda explains that ‘assemblages are made up of parts which are self-subsistent and articulated by relations of exteriority, so that a part may be detached and made a component of another assemblage’ (DeLanda, 2006,18). What this

implies is that even assemblages that appear fixed and stable are susceptible to change when connections that were assumed to be permanent, are made redundant or new connections alter the structure of an assemblage.

Thinking about the social as an assemblage, made up of parts that connect to external elements, has two significant implications. First, because assemblages form new connections with the outside, the social itself becomes open to change. As old connections disappear and new ones form, it changes quantitatively, in terms of the number of connections it has: however, more importantly it changes qualitatively or in nature. As Deleuze and Guattari put it:

*When a multiplicity of this kind changes dimension, it necessarily changes in nature as well, undergoes a metamorphosis. Unlike a structure, which is defined by a set of points and positions, with binary relations between the points and biunivocal relationships between the positions, the rhizome is made only of lines: lines of segmentarity and stratification as its dimensions, and the line of flight or deterritorialization as the maximum dimension after which the multiplicity undergoes metamorphosis, changes in nature (Deleuze and Guattari, 1987: 21).*

When this logic is taken further, it becomes apparent that as the nature of the system changes, its capacities or what it enables, also change. DeLanda discusses this process in terms of emergent properties. These are properties that arise from the interactions of heterogeneous parts so that the assemblage as a whole acquires new attributes. At the same time, the parts of an assemblage retain their unique properties, and do not lose their distinctiveness. (DeLanda, 2006: 6). Unlike fixed structures that always act in the same way and produce the same outcomes, assemblages introduce new possibilities.

## Section Two: Two Multiplatform Television Assemblages

In this section, I seek to use the concept of assemblage to theorise multiplatform television as a social formation that favours change and privileges reciprocal determination. Firstly, I explore differences between broadcast and multiplatform television in terms of assemblages. Secondly, I use two scenarios to explore how multiplatform television acts as a rhizomatic assemblage that produces new qualities, emergent properties and orderings that privilege reciprocal determination.



Two aspects of the assemblage that have particular relevance to rhizomatic television social formations are deterritorialisation, and reciprocal determination. Both are central to the process that enables change and new possibilities. Processes of territorialisation can over-code an assemblage by giving its parts fixed roles and meanings and by producing a closed unified structure with a central point of power and signification. These assemblages are based on a stable and predetermined hierarchical structure, that aim toward a unified whole and a centralised power structure. Processes of deterritorialisation, on the other hand, undo fixed orderings, disrupt hierarchical power structures, and by privileging contingent relations between heterogeneous parts, open the assemblage to new possibilities (Deleuze and Guattari, 1987: 3–25). DeLanda explains that the different relations and association within an assemblage can go through processes in which these components become involved and that either stabilize the identity of an assemblage, by increasing its degree of internal homogeneity or the degree of sharpness of its boundaries, or destabilize it. The former are referred to as processes of territorialisation and the latter as processes of deterritorialisation (DeLanda, 2006:12).

These processes also affect how agency operates within an assemblage. Firstly, agency cannot be attributed to any one component or actant, human or non-human but emerges from the association of different parts. It is intrinsically tied to the kinds of connections that make up an assemblage, and what these connections enable and what they limit. I will elaborate on this point in the final section of this essay.

An important concept for understanding how assemblages challenge the construction of the social as dominated by linear causality, is that of reciprocal determination. Reciprocal determination is a non-linear form of determination that emerges from a process of interaction. To appreciate the importance of this concept to the functioning of assemblages, it is necessary to understand how it relates to both the virtual and the actual. Assemblages function on two planes: the plane of consistency or virtuality, which is made up of becomings or pure differentiation; and, a plane of organisation that actualises these virtualities by segmenting and stratifying them. A key concept in understanding the relationship between the virtual and the actual is duration. Deleuze states that ‘duration is what differs from itself’ (Deleuze, 1999: 48). It is a non-dialectical form of difference that negates nothing and is contrasted to nothing, because it is not what differs from something else, but a continual unfolding or a continual process of transformation. In addition, every element in the virtual has a tendency or a quality and when combined with other tendencies, something new is expressed and actualised. Tamsin Loraine uses the example of a tree that might be comprised of tendencies toward bending and falling. If combined with other tendencies such as a tendency for the ground to saturate and tendency for strong winds to manifest, the tree will express falling (Loraine, 2011: 7). While this event may be read through a linear cause and effect logic after it has occurred, it is first a series of heterogeneous tendencies that come together to form an expression.

This approach means that the actual is always informed and influenced by the virtual and that, while the virtual may have an infinite number of possibilities, only some are actualised. It also implies that 'the determination of every actual being by the virtual past in its entirety remains contingent for Deleuze: it only has determinacy when read retroactively; it could always have happened otherwise' (Holland, 2013: 19). Furthermore, because the virtual and the actual are incomplete without each other, they are in a relationship of reciprocal determination. James Williams argues that '[t]hese realms depend on each other for their determinacy, that is, for the relative determinacy of terms within them in relation to others...' (Williams, 2005: 13). In this sense, determinacy is always multiple as it is contingent on a number of possible outcomes rather than a cause and effect structure.

The concept of reciprocal determination is important for challenging the centrality of broadcast television and the idea of television and television culture as something with a fixed and stable structure based on fixed roles, binaries and hierarchies such as production/consumption, producer/audience, industry/consumer and even technologies/text. These are the result of the actualisation of numerous possible outcomes, not a given. If we think about these components as simply the actualisation of a number of possible virtualities, then it becomes apparent that their actualisation is contingent on a variety of tendencies coming together and not the result of a linear logic. Furthermore, it implies that other virtualities can always manifest and introduce new qualities as different tendencies cross paths and form new television assemblages. This is a potentially interesting idea for understanding new television formations that have co-creation as a central quality, because it offers a way of exploring emergent properties. If we understand multiplatform television as an assemblage that is constantly forming new connections between viewers, texts, technologies, policies and practices, we can imagine a virtual realm full of possible outcomes. However, it is difficult to predict which will be actualised and which will remain in the realm of the virtual. This sense of contingency and chance means that social and cultural television formations are open to the new and unthought rather than limited to fixed relations. Furthermore, if we consider television in terms of territorialisation and deterritorialisation, we might think about the way that, with its centralised source of communication and one-way flow of information, broadcast television resembles a highly territorialised and codified assemblage. For example, broadcast television is a highly organised structure that revolves around a centre of significance, tends toward homogeneity and produces images and representations for viewers to consume. This includes highly organised programming and scheduling structures that may address age and gender groups at particular times, and that are based on broad generalisations. As a highly stratified assemblage, broadcast television offers viewers very few opportunities to actively participate in the media texts that they are directed to consume, the exceptions being reality and game shows, which offer a virtualised form of participation. At the same time, I am not assuming that prior to multiplatform television viewers were passive, as acts of reading and making meaning are also forms of activity. However, the focus here is on how connections between different elements engender emergent properties through new

activities and forms of participation that result in a redefinition of television and television culture.

Unlike broadcast television, multiplatform television can be understood as a rhizomatic assemblage as it contains no centre of significance and cannot be unified into a whole. Multiplatform television consists of a number of different media sites, services and devices where viewers can access the programmes of their choice at any time. Multiplatform television is also made up of a network of connections that shoot off into different directions, are sometimes temporary, and as a consequence form rhizomatic assemblages that are open and susceptible to change. Furthermore, as viewers become programmers, producers and distributors on a variety of platforms they participate in the process of assembling and reassembling television, television culture and social orderings.

In order to explore multiplatform television as a rhizomatic assemblage I now want to turn to two concrete examples. These examples are based on scenarios that describe new multiplatform viewer practices and their connection to a number of new televisual elements. The scenarios focus on the use of the Foxtel application Go and the Minecraft LetsPlay channel Stampy. The advantage of using scenarios is that they offer a tangible means of exploring the usefulness of the concept of assemblages for digital multiplatform television. The scenario featuring the Foxtel Go aims to demonstrate how this actant has led to a number of new connections that have reterritorialised television to privilege reciprocal determination over a linear determination, produced emergent qualities such as mobility, and, reshuffled agency. The scenario based on the LetsPlay channel Stampy explores a form of hybrid television that emerges from a mix of television and gaming elements. Its hybrid nature prompts questions about television's ontological status and raises the possibility that television has always been a hybrid medium.

## Scenario One: Foxtel Go—From Anytime to Anyway

I'm on the bus. I take out my iPad and open Foxtel's application the Go. I can watch programmes on 60 live channels, or I can choose from hundreds of shows and movies from the 'on demand' menu. I decide to watch the latest episode of Orphan Black (Space Canada and BBC America, 2013-) on SyFy. Foxtel Go is one of a number of television applications (or 'apps') that enable viewers to watch television on different devices. The ABC's version is called iView, whereas most of the other broadcast/network channels in Australia use the name catch-up TV after the channel's name, as in Channel 7 catch-up TV. I have chosen Foxtel Go for this analysis for several reasons. First, as Foxtel is a

multichannel platform, it has a much wider range and choice of programmes than network channels. Foxtel Go also contains a number of interesting functions such as the ability to programme a recording schedule for the iQ (the Foxtel's Personal Digital Recorder or PDR) from a computer, smart phone or tablet. It also gives the owner the ability to remotely enable parental control.

Go contributes to a new kind of television assemblage that enables new kinds of emergent properties and reciprocal determination. In particular the introduction of Go and apps like it offer new lines of connections that potentially reformulate television culture by deterritorialising appointment, mass and home viewing. In this context it is interesting to explore how activities such as creating playlists, viewing on mobile devices and searching and retrieving, privilege reciprocal determination over linear determination.

In my previous work I have examined how Foxtel iQ and playlist apps have disrupted broadcast viewing practices such as appointment viewing, mass audiences and broadcast flow through new cultural practices such as time shifting, personalisation, customisation and co-participation (Rizzo, 2007). I will briefly revisit some of these arguments here, as they are relevant to the Foxtel Go. One of the most interesting aspects of Go is that it incorporates a number of functions that were previously distributed amongst different technological devices such as the television set, the remote control, the set top box, and the Personal Digital Recorder (PDR). By doing so, it literally brings new elements into an assemblage that deterritorialises a number of connections fundamental to broadcast television. For example, while television viewing has always taken place in a number of environments, since its popularisation in the 1950s the television set and the remote control have held a central place in the home (Spigel, 1990: 76). More recently, the set top box and the PDR have become important technologies for broadcast and cable television to attract audiences by offering more control through practices such as timeshifting and multichannel environments. However, unlike mobile phones and tablets which promote mobility, I would argue that these home based technologies attempt to maintain the television set as the privileged site for viewing and the home as a central location.

By taking over the combined functions of the television set, the remote control, the set top box, and the PDR, Go produces new lines of connections that cause a shift in how we understand what television is and what it does. In this sense, the set of associations and connections that shape broadcast/network television culture are disassembled and reconfigured as some of its vital actants and their connections disappear and new ones emerge. Go becomes the primary actant within this new assemblage, as it takes over the functions of those previous entities, as well as automating and scheduling them. Moreover, it also modifies a number of other actors so that they are able to perform new functions. It

enables computers, tablets and phones to do what just a few years ago only the television set could do; that is, receive live television. Viewers are therefore no longer bound to the television set to watch live television. While viewers have been able to download programmes on computers and mobile media for over a decade, live television has remained a function of the television set. In essence, Go enables these devices to function as proxies for the television set and the Foxtel PDR. In Latourian terms we could think about Go as an entity that modifies other actors through a series of actions. This signals a shift in how television is viewed; live television can now be viewed without the need for a television set.

What is more, as Go forms multiple connections with these different components and deterritorialises fixed television configurations, mobility becomes an emergent property. New sets of relations between viewers and Go, Go and technologies such as mobile phones and tablets and between texts, viewers, apps and media technologies enable viewing anywhere. Emily Keightley and Anna Reading point out that mobility is 'fundamental to the changing nature of media technologies and their integration into everyday life' (Keightley and Reading, 2014: 208). Thinking about how mobility is actualised through new lines of connections reveals how television can be an open rhizomatic system based on contingency rather than a single determination.

Another important function of Go is that it works in conjunction with the Foxtel iQ to personalise and customise viewing preferences. Previously, I have argued that, with its integrated Electronic Programme Guide (EPG), the Foxtel iQ disrupts appointment viewing or a temporal mode of viewing by enabling viewers, to not only record programmes easily (that is without needing to know the start and end time or date) but also 'create a personal playlist from the pool of programs they have recorded, which can then be watched at the viewer's convenience' (Rizzo, 2007: 111). Go extends this function by enabling viewers to remotely set up a recording schedule on the Foxtel iQ. This means that rather than use a remote control and search through an EPG on the television set, as was the case with the Foxtel iQ, viewers can select the programmes they wish to record from any computer or compatible phone and tablet. On first consideration this function may appear to be just a frivolous gimmick. However, considering the large amount of time people spend away from the home and in front of a computer, using an iPad or smart phone to operate the television remotely offers new forms of control. The introduction of the Foxtel iQ and other PDRs had a major impact on shifting television culture from a temporal mode of viewing, where viewers tune in at specific times to watch their favourite shows, to a spatial mode of viewing that is based on a search and retrieve logic. The Go takes this spatial logic a step further by extending search and retrieve practices beyond the television set and the remote control. It makes Foxtel channels and the programme guide available on a number of different interactive devices. This new interactive multiplatform television environment

signals a shift from a linear cause and effect logic toward a multiple determination. The number of possible outcomes in the activity of searching and retrieving is not dissimilar to that of the virtual realm where what is actualised is not a result of a linear cause and effect logic, but contingent on a number of possible choices and interactions, many of which may be accidental or the process of following diverging paths.

Go's search and retrieve logic also challenges a fixed idea of a television schedule that is organised by the scheduling department of a television channel with the aim of enticing viewers to immerse themselves in its flow. Go, on the other hand, is defined by a multiplicity of possibilities that may or may not actualise as schedules. Viewing is no longer reliant on schedules as viewing on Go means choosing programmes from a number of lists and menus that can be swiped through, personalised into favourites or arranged into a number of different playlists. This form of interaction removes programming and scheduling as something that is solely the domain of the industry and reconfigures it into a shared arrangement. While the programmes on offer still rely on what the Foxtel platform supplies, new interactive forms of viewing challenge ideas of mass audiences and refine forms of personalisation and customisation. Within this rhizomatic assemblage, Go behaves as an agent that enables new viewing practices by forming connections between different parts of the assemblage including viewers, industry, texts and related technology. It has reconfigured the television assemblage so that viewers enjoy an extent of personalisation that did not exist previously. This is no small matter when we consider the scenario described at the start of this essay, where as little as ten years ago not only did viewers have very little control over where and when they watch television, but they also had to deal with incredibly cumbersome technology. At the same time, we could also ask what is lost in this new formation? One possibility is that members of a household act in isolation from each other in relation to planning and scheduling communal viewing. While many things have disrupted the practice of family viewing over the last few decades, applications like Go, as the name suggests, encourage viewers to take their television viewing with them from place to place.

Latour argues that it is through the process of reshuffling agency that associations between objects are revealed as social. He argues that the social 'is an association between entities which are in no way recognizable as being social in the ordinary manner, except during the brief moment when they are reshuffled together' (Latour, 2005: 65). By thinking about the new kinds of connections that are formed around the figure of the Go app the social effects of the previous connections, which were ubiquitous and taken for granted, are also foregrounded or revealed. Processes of reshuffling, which are prompted by the introduction of relatively small entities such as Foxtel Go, demonstrate how systems that appear to order the social in a stable structure with fixed power relations are actually temporary and open to change. Latour argues that when these changes occur 'we have to

reshuffle our conceptions of what was associated together because the previous definition has been made somewhat irrelevant' (Latour, 2005: 6). What is particularly useful about this idea is that it eschews debates about the demise of television in favour of discussions that focus on new television configurations.

## Scenario Two: LetsPlay as hybrid TV: The Case of Stampylong-head

My 7 year-old son enjoys watching 'stampylonghead' (a popular gamer) playing Minecraft on YouTube. Sometimes he watches it on the iPad, at other times he will use the YouTube app on the Smart TV. For him, it is all television. He doesn't distinguish between YouTube, watching programmes on the iPad or watching them on a television set. He also doesn't distinguish between television programmes with high production standards and amateur videos of gamers playing Minecraft. Today some of the most popular channels on YouTube are LetsPlay channels (BBC News, 7 March, 2014). These are niche channels that feature recordings of gamers playing video games with an added commentary track. The most popular LetsPlay channel is PewDiePie, run by Swedish Gamer Felix Arvid Ulf Kjellberg. Joseph Garrett's (aka stampylonghead or stampylongnose) channel Stampy, which focuses on playing Minecraft, is not far behind in popularity. While PewDiePie focuses on violent games and horror genres, Stampy is aimed at children and uses safe language and a friendly enthusiastic voice. According to the BBC, Stampy's audience is mainly made up of children between six and fourteen years old and is split along gender lines; 60% girls and 40% boys (BBC News, 7 March, 2014).

LetsPlay channels are interesting for understanding new televisual social formations because they challenge established broadcast/network production standards and aesthetics. They incorporate a mix of television and gaming elements and cultural practices. Their hybrid nature puts into question television's ontological status and the idea that it is a stable medium. While I agree with Uricchio who argues that historically television demonstrates a propensity for change and that different models of television have always existed, I would also suggest that examples like LetsPlay channels signal that digital technology has considerably increased the number of different forms of television and the rate of change.

LetsPlay channels participate in a reshuffling of agency as new connections between game cultures, online culture and television culture come together to reveal a new social assemblage around the figure of the child. One of the advantages of assemblage theory



is that it doesn't overlook the way children's emergent viewing practices reassemble the social around new forms of television. In fact, children's viewing practices should form an important base for how we rethink what television is and what it does, because today's children have had little or no exposure to television prior to a digital age. This means taking into account that children are not tied to temporal modes of viewing based on schedules and other expectations to do with broadcast television such as high production standards and established genres. Discussing today's child viewer, television theorist Jason Mittell writes:

*When my children ask, "what shows are on?", they are not referring to the TV scheduler—rather they mean what's on TiVo's menu. For them, the transmission of television via a simultaneous schedule is an entirely foreign concept, even though this has been one of the defining elements of television as a medium for decades (Mittell, 2011: 48).*

In a television environment that includes LetsPlay channels, Smart TVs and video sharing channels, today's child-viewer is unfamiliar with the broadcast/network model of television, its time based viewing and forms of address that focus on mass audiences. By engaging young viewers, LetsPlay channels reorder the production of the social away from a broadcast model and open it up to new configurations. They direct new lines of connection with game play and hence new tendencies and qualities. Even the name given to these channels 'LetsPlay' beckons viewers to become engaged and to become players rather than passive viewers. While the LetsPlay programmes themselves are not interactive, they are designed to teach and share gaming skills. LetsPlay channels are not fully television and not fully games but a hybrid assemblage that shares qualities and tendencies from both. With their simple content and amateur production standards, LetsPlay channels have very rudimentary aesthetics that challenge the broadcast/network model. By significantly renovating broadcast production and viewing practices, LetsPlay channels put into question the idea of television as a stable medium, and invite us to rethink what television is and what it can be.

According to Nick Couldry, '[n]etworks, by the particular set of links they combine, reinforce certain ways of connecting, while effacing other possibilities' (Couldry, 2008: 96). The years of stability that Uricchio refers to could be understood as precisely a set of links that reinforce particular arrangements and by doing so block other possibilities. However, digital technology has enabled new links to form that open up the television assemblage to new forms of production and new forms of engagement. By understanding television as a medium that is prone to change and transformation, as well as having periods of stability, it is not difficult to situate LetsPlay channels and Foxtel Go as two changes amongst many

in the history of television. LetsPlay channels reinvent television aesthetics by forming connections with new entities such as video games, the video gamer as presenter, and YouTube. LetsPlay channels can be seen as one manifestation of these new links, as they make little pretence at behaving like broadcast/network television. The Foxtel Go enables different devices to become televisions, and viewers to become schedulers. The examples of Foxtel Go and the LetsPlay channels demonstrate how new television can be thought of as an assemblage of heterogeneous elements that has moments of stability and moments of transformation depending on the kinds of connections that are formed. They also demonstrate how the social is refigured through the new productions and viewing practices they engender.

### Section Three: Reassembling Television: possibilities and limitations

Thinking about the recent changes in television through the concept of assemblages offers new insights into how transformations in television occur in complex and often unpredictable ways. The concept of assemblage is useful for understanding the implications of the shift from broadcast television to multiplatform television as it takes into account the way a social and cultural formation is assembled and reassembled in different periods and in different contexts. It enables us to not only to consider current television formations, but to contemplate how these connect and relate to past formations, and possible future formations. Such a focus would help us better understand the new cultural formations that are emerging in relation to multiplatform television. Particularly, relevant within an assemblage approach is how the social is assembled and reassembled through shifting associations and connections.

In concluding, I would like to return to the distinction between the virtual or the plane of consistency and the actual or the plane of stratification in order to briefly consider some possibilities and limitations of both in relation to television. The distinction between fixed stratified assemblages and rhizomatic assemblages should not simply be thought of in terms of good or bad; as by enabling and inhibiting different things both processes have their advantages and disadvantages. As a stable structure, broadcast television may not offer the personalisation and customisation features that digital television does, however it possesses some very important functions. By addressing a mass audience, it facilitates a sense of nationhood and enables the spread of important information. For Jostein Gripsrud, broadcast television plays an important role in society because it is the 'central institution within the public sphere, making essential information, knowledge and cultural experience available at the same time to all members of a particular society' (Gripsrud,

2004: 212). This unique function addresses a society as a whole and reinforces a sense of nationhood and citizenship. As a form of television that disperses its content across a number of devices and platforms, multiplatform television does not have this unifying capacity. Furthermore, Bennett and Strange point out that customisation and personalisation technologies that enable viewers to select programmes according to personal taste can limit their exposure to different kinds of programmes and different perspectives (Bennett and Strange, 2008: 111). For example, a viewer who personalises their news to receive only business news or entertainment news misses out on hard news and is not exposed to a mixed diet of news sub-genres (Bennett & Strange, 2008: 212). If one of the functions of broadcast television is to expose viewers to a variety of programmes and perspectives and for public broadcasting to enlighten and educate through a range of different programmes, then television technologies that encourage customisation and personalisation endanger these functions.

However, like the plane of stratification or actualisation and the plane of consistency or virtuality, broadcast/network television and multiplatform television should not be understood as opposites. Rather they exist in a relation of reciprocal determination where change reverberates across both planes. For example, while broadcast television continues to maintain a national presence through scheduled programmes such as evening news programmes, it is also becoming increasingly multiplatform by spreading its content across different devices and platforms that encourage viewer participation. For Deleuze and Guattari, processes of deterritorialisation are always accompanied by processes of reterritorialisation (Deleuze and Guattari, 1987: 31). Problems only tend to arise at the extreme end of either of these processes. Absolute deterritorialisation can be problematic because ‘instead of connecting with other lines and each time augmenting its valence’ it becomes destructive abolishing the assemblage all together (Deleuze and Guattari, 1987: 229). On the other hand, problems also arise when an assemblage is captured and over-coded in such a way that it becomes fixed, oppressive, highly restrictive and structures power around a central point. We might think about this in terms of some aspects of YouTube. For example, José van Dijck challenges the idea that online platforms like YouTube signal any shift in media power because they mine the metadata of users in order to target advertising to individuals (van Dijck, 2013).

Expressing similar concerns in relation to online user-generated content, Elizabeth Bird argues that ‘there seems to be increasing evidence that the surveillance and disciplinary functions of those controlling the online environment may be outweighing its liberatory potential’ (Bird, 2011: 508). Thinking about these problems in terms of assemblage theory, we could say that in these instances YouTube is captured and over-coded by molar ordering that reinstitutes a hierarchical structure and a central agent of power. Another example of the dangers of over-coding the assemblage relates to LetsPlay channels. While on the one hand LetsPlay channels disrupt a broadcast model of television and introduce new decentralised production and viewing practices, they are also under the constant threat of being reterritorialised. Nintendo, for example, has used

the threat of copyright laws to enforce the inclusion of their advertisements at the start and end of LetsPlay videos. In this way, not only do they advertise their product for free, but they also collect revenue through these advertisements (IGN News, 16 May, 2013).

Empowerment and the agency of audiences has been a contested aspect of digital media. Van Dijck, for example, questions the notion of the active viewer when she writes that ‘only a small percentage of users actually create content whereas the large majority consists of spectators or passive viewers’ (van Dijck, 2013: 47). She argues that ‘it’s a great leap to presume that the availability of digital networked technologies turns everyone into active participants’. However, viewer participation and agency should not be primarily aligned with the creation of content and spectatorship with passivity. In a multiplatform environment participation and agency can happen in more subtle ubiquitous ways; it happens through practices like using the Foxtel Go that transforms computers, tablets and phones into television sets. The Go app also behaves as an actant that modifies human capacity by enabling viewers to take control of programming and scheduling and thereby offering a certain amount of agency. Assemblage theory does not treat agency as something that belongs to or stems solely from humans or from technology alone but from the interaction of a number of heterogeneous tendencies that together produce emergent properties that enable new capacities. In addition, every assemblage contains actants, like Go, that can modify other entities giving them new functions and abilities. Without new associations or without continually forming new connections this process cannot take place and agency cannot occur. As Callon explains:

*Agency as a capacity to act and to give meaning to action can neither be contained in a human being nor localized in the institutions, norms, values, and discursive or symbolic systems assumed to produce effects on individuals. Action, including its reflexive dimension that produces meaning, takes place in hybrid collectives comprising human beings as well as material and technical devices, texts, etc. (Callon, 2005: 4).*

Within assemblage theory, agency is dependent on the kinds of relationships that are formed between different elements. According to Callon ‘This is why Deleuze and Guattari proposed the notion of *agencement*. *Agencement* has the same root as agency: *agencements* are arrangements endowed with the capacity of acting in different ways depending on their configuration’ (Callon, 2007: 320). The current transformations in television signal a process of reassembling that enables viewers to become productive agents through apps like the Foxtel Go and new forms of television like LetsPlay channels. Fixed social structures produce an impoverished form of agency because agency always

belongs to the same components or groups. However, as an interactive medium that continually forms new connections, multiplatform television is an open rhizomatic system that offers possibilities and new forms of agency that are multi-determinate and inclusive.

## Biographical Note

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## FCJ-178 Network Affordances: The unpredictable parameters of a Hong Kong SPEED SHOW

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### Abstract:

This paper examines the notion of network affordance within the context of network art. We expand on the notion of affordances, (Gibson, 1977; Gaver, 1996) to include ecological and computational parameters of unpredictability. We illustrate the notion of unpredictability by considering four specific works that were included in a network art exhibition, SPEED SHOW [2.0] Hong Kong (2013). The paper discusses how the artworks are contingent upon the parametric relations (Parisi, 2013) of the network. We introduce network affordance as a dynamic framework that could articulate the experience of tension arising from the (visible) symbolic representation of computational processes and its hidden occurrences.

## Introduction

Internet-based activities like social communications, money transactions, education, and entertainment are increasingly inseparable from everyday life. Artists work with and within this banal network and explore its affordances to address network technologies, politics, aesthetics, and culture. This paper examines the notion of network affordance, a term used in the field of Human Computer Interaction and Software Studies, within the context of network art. Building on James Gibson's theory of affordance in the context of psychology, we understand affordance as the directly perceived parameters and properties of things in an environment (Gibson, 1977: 127). The study of parameters and properties is useful in comprehending the affordances of network technologies. In the context of design, William Gaver discusses the interactivity between things and users with what he calls the affordance of predictability (Gaver, 1996). Both Gibson and Gaver call for an attention to the materiality of things. However, in addition to things that are predictable and directly perceivable, we would add a consideration of unpredictability, which includes ecological and computational parameters that are particularly important and unique in discussing network art. We illustrate this notion of unpredictability by considering four specific works from the network art exhibition SPEED SHOW [2.0] Hong Kong (2013).

This paper discusses how the artworks are contingent upon the 'unpredictable parameters' of the network; they are unpredictable because of the network's dynamic nature. We introduce the unpredictability of network affordance, expanding on Gaver's affordance of predictability, as a dynamic framework that could articulate the experienced tension arising from the (visible) symbolic representation of computational processes and its hidden occurrences. As such, we are not only examining things that we observe through visible outputs, but also considering the complex network of behaviours within, and beyond the black box (Latour, 1987: 2–3). In particular, we are interested in interactions between code and network: how code is being intervened by network parameters when it runs live; and, the interaction between and within the works themselves. As such, affordances cannot only be limited to the properties of things, but need to take into consideration the process of interaction with other things. We base our proposal on the experience of both organising the SPEED SHOW, participating in it as artists, and what we perceived as the lack of concepts available to express how the works not only modulated the space but also challenged the experience of the network.

## Network affordance(s) of the SPEED SHOW

A SPEED SHOW is a format for a network art exhibition conceptualised by Aram Bartholl in 2010. [1] The format requires the utilisation of an Internet-café as a presentation space, where computers are rented out and each computer displays a network art piece. The show lasts one evening (during the café's regular opening hours). All artworks must be on-line and live running, not pre-recorded. The idea is to present network art in a public space, outside of the white cube, in a 'quick and dirty' fashion with very little budget. Bartholl's SPEED SHOW concept has been deployed in many other cities, including: Amsterdam, Paris, New York, Barcelona, and Calgary. In 2013, we organised a SPEED SHOW in Hong Kong in a format slightly different from the original concept.

The reason for adjusting the format of SPEED SHOW into that of SPEED SHOW [2.0] was because of the unique network environment in Hong Kong. This section will describe the relevant conditions of Hong Kong's technological network infrastructure and the physical space where the exhibition took place.

As Hong Kong's industry shifts from a production based economy to an information economy, the development of information and communications technology (ICT) infrastructure has been key. In 1998, the Digital 21 Strategy was published by the government, detailing the future direction of ICT development in Hong Kong, geared towards transforming Hong Kong into a 'world-class digital city' and digital economy. [2] This strategy is composed of five main points: facilitating a digital economy; promoting advanced technology and innovation; developing Hong Kong as a hub for technological cooperation and trade; enabling the next generation of public services; and, building an inclusive, knowledge-based society. Part of this plan included the Hong Kong Science Park and Cyberport that were developed as strategic hubs to bring together clusters of IT companies, a 13 billion HKD investment. [3] ICT currently contributes 6.1% of the GDP, and Internet connection speeds, broadband and mobile penetration rates are among the highest in the world, averaging more than two mobile devices per person. [4] This advanced ICT infrastructure has been key in developing Hong Kong's *new* main business sectors: financial services, logistics and international trade. It was the foundation that partially enabled the vast commercialisation of Hong Kong through fast trading of financial capital together with the free trade zoning. ICT is also emphasised and adopted heavily in emerging sectors, including education, medical, and cultural industries. The government's plan also included making broadband not only limited to users but also affordable to further facilitate commercial ventures. The physical network, its properties, and its uses, are therefore directly related to Hong Kong's 'smart city' business model, and its calculated

shift towards an information economy. [5]

In 2008, the Digital 21 Strategy was revised to include the concept of a wireless city. As a result, major premises including government buildings, public service centres, and public housing estates, were fitted with WIFI technology for citizen's use. In addition, major local telecommunication operators developed their mobile network infrastructure to offer wireless mobile data access, including Global System for Mobile communications (GSM) in 1993, General Packet Radio Service (GPRS) in 1999, Enhanced Data Rate for GSM Evolution (EDGE) in 2003, Third Generation (3G) in 2004 and Fourth Generation Long-Term Evolution (4G LTE) in 2010. [6] Since the early 2000s, the unlimited data tariff was introduced, and together with continuous improvement in network speeds and increased functionality of mobile devices, mobile usage behaviours have significantly changed. This change encompasses socio-technical assemblages, including but not limited to technological innovation, network affordances, commercial opportunities and social interactions that give a new place to agency and efficacy. Jane Bennett reminds us that, 'an actant never really acts alone. Its efficacy or agency always depends on the collaboration, cooperation, or interactive interference of many bodies and forces' (2010: 21). As an actant, the Digital 21 strategy has impacted the city at all levels with many contributing forces. The number of mobile service subscribers is more than double of the total number of Hong Kong residents in 2014. Moreover, more than 70% of the mobile service subscribers consume mobile data. [7] Consequently, having Internet stations is no longer a value-added service as part of a cafe. Arguably, highly accessible and affordable mobile Internet has led to the obsolescence of the Internet café. Consumers no longer rely on physical stations to get Internet access. Not to mention stations occupy physical space, which is highly limited and expensive in the commercial city of Hong Kong.

Hong Kong is also one of the most densely populated cities in the world. [8] As a result, it is a vertically stacked city. Space is at a premium, thus when an enterprise is not commercially viable it disappears quickly. It is therefore also virtually impossible to run a non-commercial venue (structural funding is rare in Hong Kong). This has a substantial effect on how things are navigated and perceived. For example, when we pitched our exhibition idea, we were asked: 'if network art cannot be sold, how can it be art?' (implied in the question was the assumption that something without monetary value does not really exist, and there is no space for it in Hong Kong). Consequently, one of our main goals in organising SPEED SHOW [2.0] was to open up space for non-commercial activity outside the commodified framework of the Internet. It also meant bringing layers of non-commercial and playful activity into the commercial space. We therefore chose works that engaged the relationship of the user to the Internet in an unusual way rather than as client. Our concern was to highlight the Internet's materiality as medium (beyond usual commercial, practical, and daily use frameworks). It is important to mention that our roles in SPEED SHOW [2.0] were twofold:





invisible wifi networks through tethered mobile devices. These interventions brought a new attention to network affordances, not only extending the event beyond a commodified framework of physical structure and network infrastructure, but also to the micro-processes of affordance.

The particularities of the space stated above constitute *affordances*. “Affordance” is a term coined by Gibson, to designate different object possibilities for manipulation. It refers to the properties that can determine how a *thing* is used or behaves. The term stems from the field of psychology (from Gibson) and was brought into the field of Human Computer Interaction by Donald Norman (Norman, 1988), whose work is often discussed in relation to cognition. The term has also been adopted in Software Studies to examine the relationship between technical affordances and culture (Wardrip-Fruin, 2009; Parikka, 2012; Kitchin and Dodge, 2011; Douglass, 2007; Portela, 2013). For the purposes of this paper, we situate affordances in the discussion of network art, and argue that the current understanding of affordance lacks the explicit notion of unpredictability. Both Gibson and Gaver begin to approach unpredictability, but we believe the concept needs further articulation and emphasis. Gaver builds on Gibson’s use of the term and adds what he calls the affordance of predictability, in which the opposite is implied. Gaver (1996) uses the concept of affordances to describe material properties of the environment that affect people. Therefore social behaviour is understood as embedded in and shaped by its material context. Gaver defines the affordance of predictability as the appearance of an object that indicates the possibilities in which it may function (Gaver, 1996). Interestingly, he posits that there is a: ‘tendency for electronic technologies to reduce the affordance of predictability supporting everyday social behaviour.’ (Gaver, 1996: 4). Gaver gives the example of paper and explains that the affordances of paper are different to those of electronic media, largely due to the fact that with these technologies the storage medium is different to that of the display. Paper is predictable because the surface that is seen and touched is used for writing (storage), while simultaneously displaying the text (display). It is therefore obvious to the user how to interact with this object inasmuch as the storage and the display are the same. However, when these are not embedded in the same surface, such as a computer for example, the experience becomes unpredictable. The computer screen displays what is stored in the hard drive (or on networked servers), making it much more difficult to imagine what its affordances are. Thus the invisibility of connections between interfaces and the separation of their function (that is, storage and display) creates unpredictability.

Consequently, the notion of unpredictability requires rearticulation in the context of computation. That said, unpredictability does not just stem from variable combinations and invisible connections, it comes from large sets of data producing random elements, ‘parametric relations’ (Parisi, 2013: 86), and ‘intra-actions’ (Barad, 2007:33) between all



layers of the environment, and the modulation of space by software (Kitchin and Dodge, 2011). In the following sections we will examine works from the SPEED SHOW [2.0] through the lens of *unpredictable parameters*. We will argue that an expanded notion of affordances facilitates the articulation of the experience of network art and also contributes to a discussion about how these *hidden* parameters are visibly shaping our environment.

## Unpredictable parameters

We suggest that the notion of affordance should not only be limited to the predictability of material properties, such as shapes and functionality, but should also include relational parameters that might not be visible to audiences. We want to emphasise that affordances are constantly shifting and are subjected to the conditions and happenings of the network. Given the same set of networked artworks, it is possible to see how they behave differently under varying circumstances with the dynamics of network and the live running of code. To make this observation we borrow concepts such as: data entropy in computation (Parisi, 2013), ‘parametric relations’ (Parisi, 2013: 86), the performative dimensions of code (Kitchin and Dodge, 2011), and the transduction of space (Kitchin and Dodge, 2011), to structure a framework of unpredictable parameters. These unpredictable parameters are driven by computational processes that include the relations between running code, network protocols and data manipulation.

The show included six works from local and international artists: Olia Lialina *Summer* (2013); Tonio Mundry *You better brush your teeth* (2013); Fannie NG *Reality in RGB* (2013); Helen Nissenbaum and Daniel Howe *TrackMeNot* (2006) ; Helen Pritchard and Winnie Soon *The Likes of Brother Cream Cat* (2013); and Audrey Samson *threads/* (2010). The relations of unpredictability are most apparent when we think about how data is created, processed and manipulated. Four specific works from the exhibition show different dimensions of unpredictability: the distributed network environment of *Summer*, the socio-technical assemblages of *The Likes of Brother Cream Cat*, the search engine parameters in *threads/*, and the operations of space modality in *TrackMeNot*. The works of Mundry and NG address perceptions of reality versus what has been traditionally called virtual reality, rather than unpredictability. We therefore chose not to discuss these works in this paper.

The title ‘SPEED SHOW [2.0]’, as mentioned previously, references the promise of “Web 2.0”. For example, 2.0 was said to be characterised by user-generated content fuelling web searches based on page rank algorithms, a participatory network that anticipated the prevalent social networking culture of today, dynamic interfaces, and platforms based on

collective intelligence and peer production (O'Reilly, 2005). Lialina has argued that the ever-changing technological environment continuously influences network art (2009). The works chosen in this show depict the different characteristics of 2.0. *The Likes of Brother Cream Cat* criticises the so-called participatory promise of social networking sites like Facebook. *TrackMeNot* and *threads/* address issues that stem from user-generated content and collective intelligence, such as surveillance based on search data used for analytics and the homogenising power of Google's ranking algorithms. *Summer* is a playful nod to the pre-dynamic interface created through collectively produced image generation. As Lialina has commented, Internet-based artworks can be seen in different forms, such as browser add-ons, in contrast with earlier standalone websites. Artists use different ways to experiment with the network and they can be also seen in discussions on software art or under the larger umbrella term of 'media art' today (2009). Therefore the works chosen illustrate our position that Network art should be viewed more broadly in parallel with the technology of the Internet, as well as encourage us to think about the cultural and political aspects of Internet technology.

## Parameters of the network environment

The question that came to the fore was one of how digital images are being manipulated by their environment. Gibson says, 'different objects of the environment have different affordances for manipulation' (1997: 128). This section will discuss how the network environment manipulates digital images in Olia Lialina's work. *Summer* (2013) is made up of twenty-one different images that each reside on a server in a separate physical location around the world. A browser displays a series of images, that show Olia swinging on a swing (see figure 2.). In fact, twenty-one separate scripts are programmed such that the browser cycles through the servers, refreshing the page each time, thus serving a sequence of images that appear like a *slow-motion* GIF animation. In other words, the animated image performs in an environment that has different networked and material affordances. Affordance here includes the understanding of data processing through servers, code and browser behaviours.

The repeatedly loading images are closely tied with the characteristics of code. Although the representation of the image—the woman on a swing—is invariable regardless of the time it takes to load, the image is displayed dynamically in an unknown timeframe. In this, we do not refer to the subjectivities of time, but to the actual time it takes to load a sequence of images. This time is influenced by many different and unpredictable variables. Gibson argues that, 'an affordance is an invariant combination of variables' (1977: 134). What are these variables in relation to the network and the code? In *CODE/SPACE*, Rob

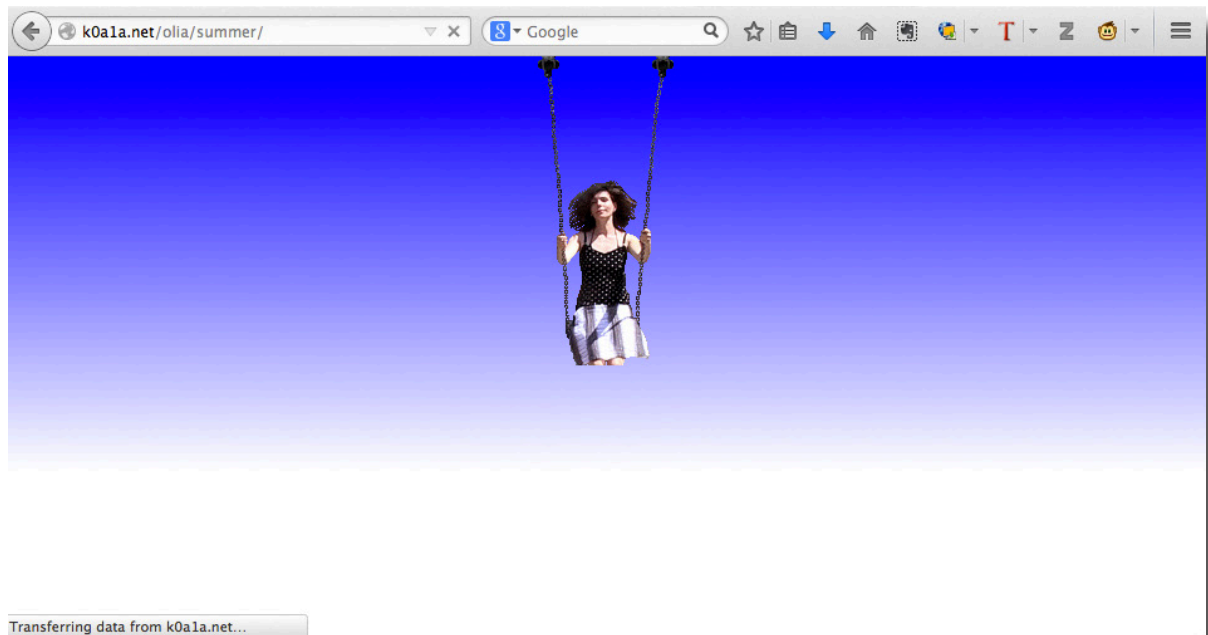


Figure 2: Screen shot of *Summer*, by Olia Lialina

Kitchin and Martin Dodge suggest that executive code might be able to listen to its environment through objects (Kitchin and Dodge, 2011: 54). In the work *Summer* the script runs inside a browser as an object. It outputs visuals according to the script's instructions. However, the browser does not always output the exact result according to script's instructions. The characteristics of code—programmability, interactivity and capacity—exist in relation to infrastructure, material form and social parameters; forming assemblages of data sensed from the environment (Kitchin and Dodge, 2011: 54). In the work *Summer*, the animation cannot perform without continuous access to other technologies and networks which are located in other spaces. This is achieved through the programmability of code that is executed within a browser at the exhibition. The browser renders the script from a distant server, retrieving and loading an image. After an image is displayed, it immediately calls for another server to do a similar procedure and refreshes the page. Any single server failure could result in the display of an error page that causes the whole animation sequence to stop. In other words, code does not only function as to how it is written, but also with a capability to sense the availability of data and the network. Code is required to establish a network connection with different servers, directing the Uniform Resource Locator (URL) from one to another. The programmability of code enables the changes of URL and server space redirection, as well as the changes of an image display. These constantly alter the behaviour of how the work is presented in a browser. There are also constant negotiations between, and within, network protocols and network layers for delivering data (Osterloh, 2012: 62). These are dynamic actions and changes. The different works in SPEED SHOW [2.0] must also negotiate between themselves for the network and share the various layers involved in packet transmission. The six works were distributed over three phones tethering the mobile network, thus two works per IP address. Therefore

the works share addresses as well as bandwidth. In the case of Olia's piece this impacted the visual render through slower or faster image loading speed. Depending on how 'data heavy' the pieces that were sharing bandwidth were, the process of loading could result in low resolution images. In other words, network affordances cannot be regarded as static parameters, but behave more like Barad's 'process of intra-activity' (2003: 817–818). This observation is not about the properties of code or the network per se, but how things perform and things-in-actions (Barad, 2003: 802), open up a temporary space in time through on-going negotiations and reconfigurations. Code is programmable, following lines of instruction and executing them to perform a certain function; but once it starts running, code creates a temporary relational space where different micro activities are interacting. If one of the servers went down an error page would be displayed, and everything would stop performing, as the script stops running because a static error page is displayed. Although this did not happen during the SPEED SHOW [2.0] exhibition, Lialina was prepared for this unpredictable moment, and ready to contact the artist who hosted that particular page and image in order to fix the problem.

The distributed nature of the work opens up 'different agential possibilities' due to 'the very nature of dynamics' (Barad, 2003: 817–818), including both humans and nonhumans. Therefore, code—as Kitchin and Dodge note—is not only a matter of its programmable capability; the relationship and the environment that surround the running code are constantly changing the conditions, which include social relations, other technical apparatuses, space and time (Kitchin and Dodge, 2013: 66).

The work displays both image and URL one after the other in a browser. This animated and perceived data, in the form of image and text, takes us along like packets cycling across the globe. For example, a packet cycles from a US-based artist Evan-Roth to a German-based artist Danja Vasiliev. Each time the page refreshes, the image data has to travel from a different place to SPEED SHOW [2.0] in Hong Kong. These packets of data go through numerous network pipes via different service providers. During the SPEED SHOW [2.0] exhibition, the Internet speed was significantly slow and highly unstable. A mobile cellular network was used instead of a fixed line broadband or a Digital Subscriber Line (DSL) technology. The network speed was greatly reduced because of the processor, the active applications, the small mobile device memory, and the slower data connection. In terms of connectivity, the data traffic of a mobile cellular network is more 'bursty' (Zhang and Arvidsson, 2012: 16), which impacts the system performance (Hegde and Sohraby, 2002: 132). All these factors increased the instability and unpredictability of the code running and data representation. As a consequence, the audience could clearly see each individual frame and the loading process of each image. The assemblages of the network dynamically reconfigure affordances, they literally effected how the work performed, and how it was perceived in SPEED SHOW [2.0].

## Parameters of socio-technical assemblages

Another key feature of the exhibition was the way in which the social and technical aspects of the network environment interacted together. These socio-technical assemblages were most apparent through a browser add-on: Pritchard and Soon's *The Likes of Brother Cream Cat* (2013). Pritchard and Soon's work is about a popular cat figure, Brother Cream, that permeates the Internet through network activities. Brother Cream became famous in 2011 through generating lots of 'likes' in Facebook. Since then he has attracted over 1000 visitors per day in a 24-hour convenience store. People queue to take pictures with him to post on the Internet. However, Brother Cream does not always show up for photo taking. In this work the network is conceived as a relational space where various social-technical relations are actively taking place, both outside and within the network, at different moments in time. Conceivably, *catness*—the animality of Brother Cream—invades the network through the performativity of Facebook and the dynamics of social-technical relations (Pritchard and Soon, 2013).

In a digital network like Facebook, the space is not only modified by users' participation or human social interactions, but also the relations between network protocols, databases, and code. Facebook enables a real-time circulation of data that has been stored in databases. This circulation does not only appear in one single interface, but in a space of fluidity and multiplicity. For example, a posted image will get replicated and circulated through a friend's network. In the case of Brother Cream's fan page, a new image posting technically reaches more than 170 thousand people. [10] The action of posting cannot be viewed as more than just a reduction of a single post display, because each post is also linked up with other friends' status updates and social actions, such as likes, comments and shares. All these are related to data complexity and relations, coding structure, and network interaction as network activities. These dynamic network activities cannot be regarded as a single instance, as they lead to a chain of reactions that are generative, participatory and contingent. Each profile's archive and current data, such as records of activity and connectivity, generate a snapshot of 'parametric architecture', introducing 'real-time variations' that are constantly changing (Parisi, 2013: 85).

Parisi explains the notion of parametricism as follows:

*[P]arametricism implies the inclusion of contingent values (as if from the "out-*

side”) but rather partake of the software environment of parametric relations. Parametric programming is therefore not just concerned with the computation of possible (already existing or actual) elements, but also, and significantly, with how intensive relations between finite parameters can engender new smooth spaces. (Parisi, 2013: 86; author’s emphasis)

Therefore, a single image of Brother Cream’s trace has to be considered from the computational perspective of relationality and contingency, where the performativity of code reconfigures the intensity of the cat’s network invasion. This Cream Cat trace, as described by Parisi, ‘is determined by an unlimited number of variations occurring through time, and is unfolded into an environment of differential relations, speeds, and intensities’ (2013: 46). Within the network of the cat trace, all sequencing, sorting and representation are highly computed and dynamic, it involves things such as the spatial and temporal dimension of activities: code running, cat presence and participants’ activities. The object of the cat trace cannot be reduced simply to static image data. In this context, we have to consider these parametric relations in order to understand the underlying assemblages, which are dynamic and unpredictable. Data is constantly intervening the ordering and intensity of the social space.

After a person logs into her Facebook account, *The Likes of Brother Cream Cat* continuously parses Facebook data and replaces every single image on the screen with Brother Cream Cat (see figure 3.). Audiences experience an augmented browsing with this on-the-fly image replacement, which are all drawn from the latest cream cat trace.

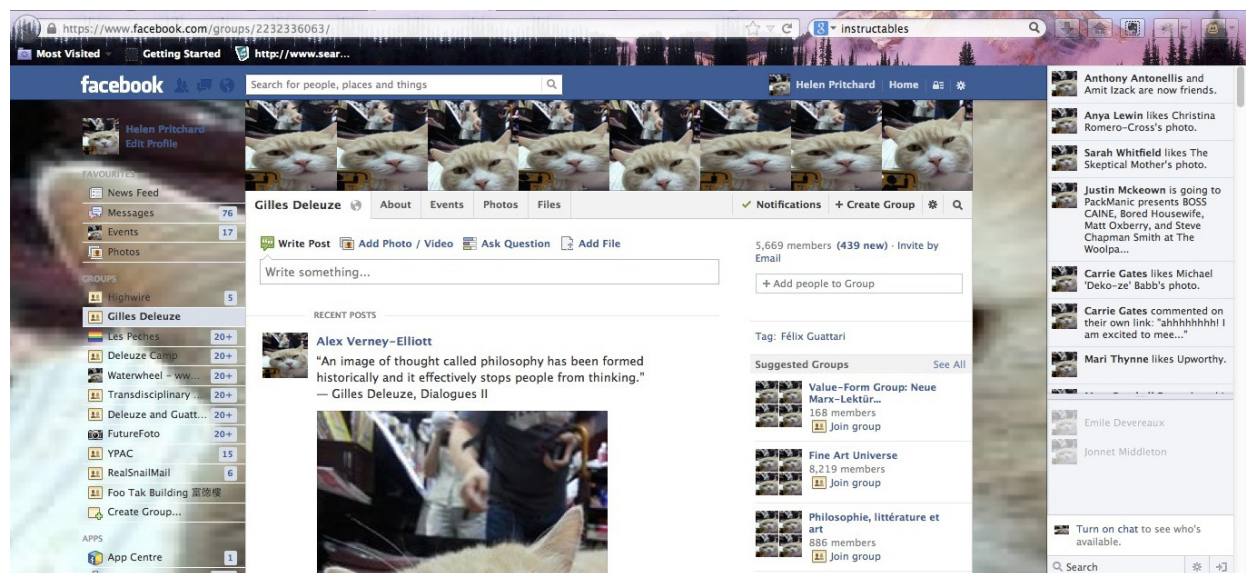


Figure 3: Screen shot of *The Likes of Brother Cream Cat*, by Helen Pritchard and Winnie Soon



The add-on code intervenes with the Facebook code by scanning all the images' data fields and replacing the original parameter of an image URL to the cream cat image's URL, resulting in a hijacked interface.

The subverted images are continuously updating, which are subjected to the network activities surrounding Brother Cream Cat. The project uses the method of scraping, a computer scripting technique of webpage data harvesting that continuously reads the Brother Cream Cat's Facebook fan page. The temporality of the artwork is subjected and is affected by numerous visible and invisible interactive parts, including the scraping time, Brother Cream's fan uploading time, the networked user activity time, the audience's browser scrolling time, the Facebook code running time and so forth. All these temporal processes are unique events that are continuously happening and reconfiguring the networked space. The running of *The Likes of Brother Cream Cat* unfolds the social space through time on the fly. The add-on does not determine the aesthetic of the interface in advance. Indeed, the unpredictability is something that is subjected to the socio-technical assemblages that come into relation at every moment of time.

*The Likes of Brother Cream Cat* runs in the form of a browser add-on that works on specific configurations and situations. For instance a specific Firefox browser and a particular Facebook version are required to run the add-on successfully. However, wider economic and political forces are constantly acting upon the artwork. The browser version and the Facebook platform keep updating with newer versions, offering different functions, interface changes, bug fixes and performance enhancement. Consequently, the add-on also needs to keep updating in order to accommodate such technical changes and social demands. The constant need to respond to the network relates to the material agency of technological artefacts. Since Facebook is running on the network, most updates are barely noticeable unless they are technical changes related to the interface. As such, the artwork always suffers from potential failures. Although the work ran smoothly during the exhibition, it fails to run at the time of writing this article. In addition to potential failures, the work experienced significant browsing delays during the exhibition. It took a lengthy time to flip from one page to another, or to load the images. The speed of the network is also highly influenced by the battery of the mobile devices, which supply and share the Internet connection. Although the add-on's code has been run, it nonetheless takes time to take effect in the browser. The code running time becomes out-of-sync with the data representational time and results in unintentional cracks, that demonstrate socio-technical relations and invisible network intensities.

## Parameters of the algorithmic database, Google Search



While the *The Likes of Brother Cream Cat* subverts the Facebook database, Audrey Samson's *threads/* explores how the algorithmic database unfolds into the cultural sphere of imagery. *Threads/* shows the top images culled or 'scraped' from a Google search on the subject of women and technology (see figure 4.). It makes use of the affordances of the Google search engine, a giant database platform that is constantly updating and manipulating data. The culled images are mapped to a directory of pre-recorded audio excerpts from interviews conducted with women on the subject of their use of the computer and their feelings towards it. The voice of the interview is triggered when an image is clicked. These interviews were initially conducted in both English and French, which is reflected in a bilingual interface. The piece is an investigation into the cultural imagery associated with the motility of words and meanings across languages, and its relationship to the search algorithm.

The images returned by a Google image search of the same terms in different languages has different results. The query that is effected whenever the page is loaded or refreshed returns the top 40 images of the terms: "women + technology" or "femmes + technologie". These images are resized into thumbnails and placed in a grid like structure on the

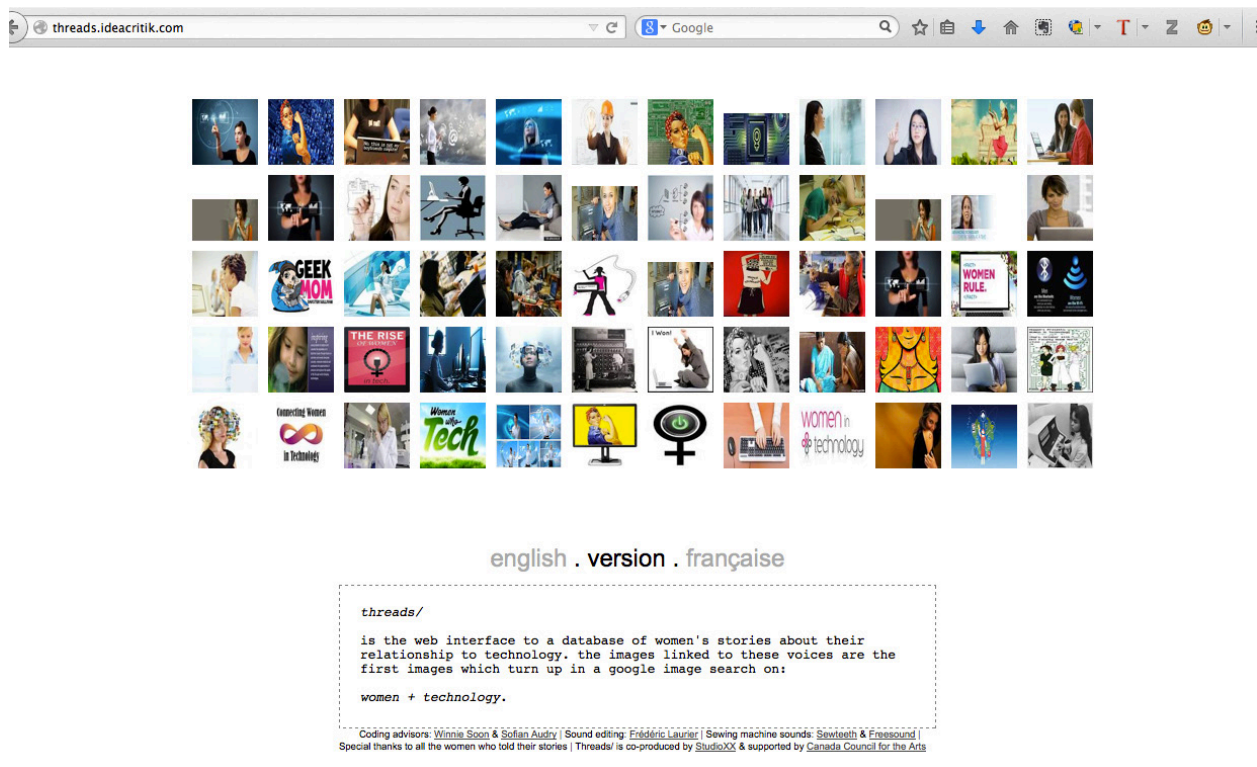


Figure 4: Screen shot of *threads/* by Audrey Samson

webpage. Each thumbnail is dynamically associated with an audio file from an array of interviews conducted in the language of the search query (that is, the French interface couples the thumbnails with interviews in French). In other words the sound coupling is dictated by a randomising function and changes when the page is reloaded. In addition, the results of a Google search are not solely based on keyword input and previous search history, but also based on the geographical location of the device. [11] The search entry: “women + technology”, will return different results depending whether it is sent from a device with a Hong Kong Internet Service Provider (ISP) or one with an American ISP for example. The piece therefore appears differently to any given viewer based on various criteria such as: geographic location, language of query and previous search history.

In addition, these criteria interact and influence each other, as well as compete for search rankings. That is to say that the country’s ISP, in relation to the user’s previous search history and the search entry will be computed in Google’s patented query formula to produce an array of results (Feuz, Fuller and Stalder, 2011). The array is dynamic because the variables such as the user’s search history and the most ‘popular’ search results in Google’s top ten list are always changing. One of the important factors contributing to the results is the computation of massive amounts of data. Google continues to dominate the search engine market share, [12] the computation process involves a complex and sophisticated logic of search data mining, including web crawling, personalised search, email and Google advertisement analytics and many others. Therefore, the search mechanics keep evolving and the results are unpredictable. One could argue that if the Google query algorithm was known it could be possible to predict the outcome of its computation. However that would be a false assumption because the search engine algorithm refers to itself. For example, the top results are influenced by the sites that pay to advertise, which means they are placed at the top of the page. These sites will then get more visits and result in a higher ranking. As an interviewee working in the subversion of Google rankings tells the *New York Times*: ‘My own personal experience says that the guy with the biggest S.E.O. budget always ranks the highest’. [13] Ironically, Google was initially started as a response to such elliptical search engine behaviour (Brin and Page, n.d). Beyond this, it is difficult to imagine how the results of a query might be imagined even if one knew the algorithm. The different parameters, and the self-referential and recursive aspect of the search function lead to unpredictable results. Moreover, the manipulation of massive data shapes how we perceive the world at a specific moment of time. A user types certain keywords in the search engine bar on a particular subject in search of elucidation through ranked searched results, which are returned in the form of a hierarchical list of textual elements, images and videos. As a result, the Google search function is manipulating knowledge and constructs a particular ideology for its users (Knight, 2014). This is made apparent in the work of *threads/*, inasmuch as the image results of the keywords are constantly updating according to different browsers, locations and time, making these network affordances tangible.

In addition to the unpredictability of web searches that is based on factors that we can imagine, Parisi (2013) also suggests that we must also take into account other unpredictable factors such as incomputable data. She explains that ‘even the simplest cellular automata are already infected by complex, incompressible, random information’ (Parisi, 2013: 42). That is to say that in addition to the complex sets of data that are computed, there exists random data that is inherent to digital data. All data sets are therefore already populated by non-computable entities, creating an entropic ecosystem which makes any prediction of an outcome impossible. The Google search results are also highly impacted by complex algorithms and the scaling of data (Brin and Page, n.d). That is to say that not only do criteria interact to produce an unpredictable outcome, but incomputable data also contributes to the entropy of the system and therefore to the search results. In this sense the results are not only dynamic and unpredictable but they are based on data that is in itself random.

*Threads/* uses search engine parameters to show that language is associated with imagery across cultures and geographic locations. By the same token it foregrounds the search engine’s affordances in showing that the piece appears differently respective to geographic locations and query language. The unpredictability of the results is further influenced by the nature of the algorithm and the non-computable entities that infect the system.

## Parameters of space modality

Following the previous discussion about the nature of the search engine as an entropic system, in this section we propose to use data entropy as an affordance to describe the experiences surrounding network art in Helen Nissenbaum & Daniel Howe’s *TrackMeNot*. *TrackMeNot* is a browser extension that helps protect web users from surveillance and data-profiling by search engines. The extension works by periodically issuing fake queries to selected search engines, thereby adding meaningless data to the search history—things the user is not actually searching for. Therefore, the user’s resulting search history profile is a construction that is mostly unrelated to the user’s behaviour. In fact, *TrackMeNot* could be said to be an extension designed with the purpose of increasing the entropy of a user’s profile. Its goal is to elude precise behavioural tracking and mapping by search engines (and whoever has access to that information). Complex computation introduces data entropy, a notion Luciana Parisi refers to in *Contagious Architecture*. For Parisi, data entropy results from the random data that stems from the computation of infinite sets (Parisi, 2013: 153). Parisi argues that data entropy is inherent to all computation systems and that the *contagion* must be carefully considered as it permeates all layers of our

existence from the stock market to political decision-making. *TrackMeNot* demonstrates how the concept of network affordance needs to also include the notion of data entropy, along with speed, spatiality and code. Thus we need to extend Gaver's definition of affordance to include entropy. The following section explicates how the notion of entropy and algorithmically modified space shape the user's immanent experience.

The choice of how to present *TrackMeNot* \* within *SPEED SHOW* [2.0] was challenging, because it is a browser extension and therefore it does not have a browser based interface as such. In a way, this reflects the challenge of presenting any form of network art by highlighting the black box (Latour, 1987: 2–3) of computational networks. Network art often tries to make the invisible forces of computational processes tangible by addressing them directly, but it remains difficult to convey that which cannot be seen. *TrackMeNot*\* has a static homepage that describes the project, it is explicative but does not reflect how the piece works. However, it is possible in the extension's settings to enable a secondary tab (running in the background) that shows the search engine queries as they are being sent. The query frequency can be set from every 6 seconds to once per hour. The search engine webpage appears along with the algorithmically generated search terms and search results. The page is constantly refreshed with new terms automatically populating the search entry field, and consequently new results. That said, the terms are not just changing based on a static dictionary of words or list of phrases. They evolve based on an emulation of human response to the search results, this helps to create the next automated search query (Howe and Nissenbaum, 2009). The page is visually dynamic and refreshes often (depending on the network speed). Conceivably, it is visually translating the algorithmic process. The constant refreshing of the page suggests recursion, and as the page keeps reloading at a fairly consistent rate, each time showing a different query phrase in the input field, it also emphasises the repetition of the code.

The algorithmic process is also intertwined with the geo-location as well as the space created by the software. *TrackMeNot* then points to a new modality of space, modulated by software and also contaminated by non-computable data. Kitchen & Dodge conceptualise space to be 'constantly in a state of nondeterministic becoming, operationalized through the process of transduction' (2013: 80). They use the term "code/space" to refer to the transduction of space by software. For example, they describe the space of the ATM (Automatic Teller Machine) as a combination of both the dynamic networked bank server data and the machine itself, physically located on a street. They argue that software transduces new forms of spatiality, partially because of this ceaseless modulation. Similarly, *TrackMeNot* also modulates spaces: the physical café in which the work is presented (computer screen, interaction between people around the screen), the network space where exchanges and modification of data occur (preferences and history logs), and the hardware space that facilitates such exchanges (cables, server farms and routers). This

assemblage of relations is exemplified by the geo-location. The *TrackMeNot* algorithm does not mask the device's Internet Protocol address (IP). The location of the café where the exhibition physically takes place is therefore associated in the registry of the search engine query. In addition to the *TrackMeNot* generated queries, the *threads/* piece sharing the IP address through phone network tethering is also sending its own queries. Queries from both pieces that are sent to the search engine by the algorithm are coupled to the same IP (in this case the same phone). The IP related Google history, and the evolving *TrackMeNot* results, will therefore be contaminated by both works. Therefore, the 'code/space' of the café also evolves with these new queries/results. IP is a geographically specific identifier of the device, the network, and the geographic location. The IP address that is being shared between two works, through the phone tethering, results in the works mingling of identities. These elements therefore become intertwined, acting in relation to each other, creating an evolving space of intra-actions (Barad, 2007) between geo-graphical space, software, hardware and Google query history.

*TrackMeNot* generates automated queries that are unrelated to the user's actual search behaviour. Therefore, the automation is adding data to the user's search history, and to Google's query database. The algorithm produces an evolving set of data. The code/space therefore evolves independently from the user. In addition to the data generated by the artists' software, the process of continuous fake data generation produces infinite sets. We could therefore say that there is a contagion of non-computable data that results from the generation of these infinite sets (Parisi, 2013). This data is based on the concept of transcendental numbers (which are uncountable because they are based on infinite sets), and the mathematical concept of the non-computable (which cannot be enumerated by any algorithm), such as Chaitin's constant (Parisi, 2013: 17). Parisi also argues that as a result of the emergence of this non-computable data, computation creates spatio-temporalities revealing a new mode of thought which is proper to digital computation: soft thought (Parisi, 2013: 223). She argues that a human cannot understand this mode of thought, but can however immanently experience it. Therefore this work with its ceaseless generation of data emphasises the code/space through its refreshing interface, but also alludes to something we can only experience in the protentional dimension (Petitot, Varela, Pacoud, and Roy, 1999). Soft thought would suggest that the user's experience of the space is modified by the presence of this work, and the resulting assemblage of relations that evolves from the code/space does so not only on a perceptual level, but also immanently. In other words, the immanent experience is shaped by the code/space infected with incomputable data.

## Conclusion

In this paper we have discussed the unique network setting of SPEED SHOW [2.0] Hong Kong and have illustrated how a number of the artworks presented were contingent upon the ‘unpredictable parameters’ of the network. Each artwork performed differently under varying circumstances. Networked tensions were generated between the works, as each work needed to compete for data network access. The careful consideration of network affordances helped to elucidate the invisible actants (Latour, 1996: 2) at play and how they impacted on our experience of the network.

We have built upon Gaver’s “affordance of predictability” and introduced network affordance as a dynamic framework to discuss network art. We have argued that the existence of these unpredictable computational dimensions has not been sufficiently considered in the existing discussion of affordances. The network environment that we mainly consider through Lialina’s work *Summer*, shows that parameters like network infrastructure, speed and connectivity increase the instability and unpredictability of the data representation visible to the viewer. There are on-going negotiations and reconfigurations between these parameters that effect how the work performs, and how it is perceived. The concept of the network is therefore conceived as a relational space as discussed with regards to *The Likes of Brother Cream Cat*. Brother Cream exists both outside and inside the network, unfolding the social space where various social-technical relations are actively taking place. The cat invades the network based on the performativity of code. This example also emphasises how dynamic and unpredictable parametric relations act in and out of the network through socio-technical assemblages. The discussion of *threads/* examined the affordances of search engine parameters. We considered how the piece relates to algorithms and demonstrated how criteria such as geographic location, language of query, and previous search history interact with incomputable data to produce an unpredictable outcome. The entropy of the system and the nature of the algorithm influence the unpredictability of the results. Similarly, *TrackMeNot* plays with data entropy to obfuscate user behaviour from search engine analytics. The piece as it was shown in SPEED SHOW [2.0] visually translated the algorithmic process and therefore visually represented the transduction of space that was created by the software. We also argued that this piece shows how the immanent experience of the artwork is shaped by the code/space and infected with incomputable data. Each of the works therefore demonstrates different parameters of unpredictability that exemplify how the ecology of the network and its socio-technical assemblages actively shape our environment and consequently our experience of it.

Our position as curators also contributed in manipulating the affordances of the exhibition.



Firstly our interests as researchers are rooted in network materiality and liveness. We therefore chose to exhibit pieces that would explore these aspects. To further emphasise these notions we considered which works would share the same network, again somewhat controlling rendering through the speed/network sharing. We were also concerned with choosing pieces that could attempt to make a break in the heavily commodified Hong Kong landscape. These concerns are resonating with current events. At the time of writing this article, Hong Kong was experiencing the Umbrella Movement, an occupation with demands of true universal suffrage for the region. [14] The occupy movement was catalysed by climbing over a fence to reclaim Civic Square (though this space is claimed by the Hong Kong government while it borrows the misleading nomenclature of ‘public’). This reclamation was a symbolic act of agency. The space has since been ‘taken back’ by the authorities but thousands of tents occupied the surrounding area, bleeding into main arteries of the central district. In the beginning days of occupy, the pro-democracy protesters shifted their communication channels from centralised social media applications like WhatsApp and Facebook to the peer-to-peer messaging application FireChat. The shift was in response to the rumours that mobile telecommunication network was being cut. FireChat relays messages through bluetooth, thus meshing local networks. We were inspired by this quick decentralisation of communication to imagine potential futures of the SPEED SHOW model: site-specific works, put up on the fly, broadcasted on a local network. The visitor would have to visit the location to have access to the piece, and the piece in turn would answer to the specific location, bringing the physicality of a location and its affordances back into the experience.

The prevalent tensions that stem from the incongruence of the symbolic representation of computational processes and its actual processes and complexities is not only an issue of network art, but could possibly apply to all *invisible technologies* that permeate our existence. As we have seen, the discussion of network affordances therefore has a broader scope, from ubiquitous computing, to the politics of smart cities and other future technologies that would seamlessly integrate into our lives.

## Author Biographies

Audrey Samson is a Hong Kong based artist and researcher. She is currently a PhD candidate at the City University of Hong Kong. Her research/practice focuses on network materiality and digital data funerals.



Winnie Soon is an artist-researcher based in both Hong Kong and Denmark. She is interested in the areas of network art and computational culture where her research focuses on the notion of *liveness* in Software Studies. Currently, she is a PhD fellow at Aarhus University.

## Notes

[1] See the SPEED SHOW website: <http://speedshow.net/>

[2] See the Digital 21 Strategy: <http://www.digital21.gov.hk/eng/strategy/2008/foreword.htm>

[3] See Information Technology Services Industry in Hong Kong: <http://hong-kong-economy-research.hktdc.com/business-news/article/Hong-Kong-Industry-Profiles/Information-Technology-Services-Industry-in-Hong-Kong/hkip/en/1/1X000000/1X006NLI.htm>

[4] Digital 21 Strategy booklet: <http://www.digital21.gov.hk/eng/relatedDoc/download/2014D21S-booklet.pdf>

[5] Digital 21 Strategy booklet: <http://www.digital21.gov.hk/eng/relatedDoc/download/2014D21S-booklet.pdf>

[6] The major Hong Kong telecommunication operators include Smartone Telecommunications Limited, HKT Limited (Formally called Hong Kong CSL Limited) and 3 Hong Kong. See the news and press releases regarding different network launches in Hong Kong: GSM and GPRS network by Smartone: [https://www.smartone.com/about\\_us/media\\_centre/press\\_release/2003/06/2003\\_06\\_18.html](https://www.smartone.com/about_us/media_centre/press_release/2003/06/2003_06_18.html) EDGE network by Hong Kong CSL: <http://www.businesswire.com/news/home/20030825005268/en/Hong-Kong-CSL-Awards-Nokia-EDGE-Network#.VGxUqYes0I0> 3G network by Three: [http://www.three.com.hk/website/appmanager/three/home?\\_nfpb=true&pageid=001001&\\_pageLabel=P200470391219567710594&lang=eng](http://www.three.com.hk/website/appmanager/three/home?_nfpb=true&pageid=001001&_pageLabel=P200470391219567710594&lang=eng) 4G LTE network by Hong Kong CSL: [http://www.zte.com.cn/endata/magazine/zetetechnologies/2013/no5/articles/201309/t20130917\\_405909.html](http://www.zte.com.cn/endata/magazine/zetetechnologies/2013/no5/articles/201309/t20130917_405909.html)

[7] See the Hong Kong Fact Sheets released by the Hong Kong Government in 2014: <http://www.gov.hk/en/about/abouthk/factsheets/docs/telecommunications.pdf>

[8] See the Hong Kong government 2013 population census: <http://www.gov.hk/en/about/abouthk/factsheets/docs/population.pdf>

[9] According to the mobile research report from Google and Ipsos MediaCT, Smartphone penetration in Hong Kong has risen to 63% in Q1, 2013. <http://www.startupshk.com/google-reveals-that-96-of-hong-kongers-never-go-without-their-smartphones-and-browse-the-internet-daily-highest-rate-in-asia/>

[10] The number of fans in Brother Cream Cat Facebook is more than 170,000 as of September 2014. <https://www.facebook.com/pages/%E5%B0%96%E6%9D%B1%E5%BF%8C%E5%BB%89%E5%93%A5/117969648299869>

[11] See Google's patent 'Short query-based system and method for content searching': <http://www.google.com/patents/WO2006083974A2?cl=en>

[12] See the Search Engine market share details here: <http://returnnonnow.com/internet-marketing-resources/2013-search-engine-market-share-by-country/>

[13] See the New York Times article: [http://www.nytimes.com/2011/02/13/business/13search.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2011/02/13/business/13search.html?pagewanted=all&_r=0)

[14] More details about the Hong Kong Umbrella Movement: [http://en.wikipedia.org/wiki/2014\\_Hong\\_Kong\\_protests](http://en.wikipedia.org/wiki/2014_Hong_Kong_protests)

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