A Peer-Reviewed Journal About

DATAFIED RESEARCH

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EDITORIAL

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This issue of *APRJA* examines the implications of datafication for research. Following a research workshop at the School of Creative Media, City University of Hong Kong in October 2014, it addresses the thematic framework of the 2015 transmediale festival "Capture All" as a research topic: "to investigate and propose actions that push against the limits of today's pervasive quantification of life, work and play", as the call explains. Indeed, to what extent does data "capture all" — even research?

We produce, share, collect, archive, use and misuse, knowingly or not, massive amounts of data, but what does its "capture" do to us? What are the inter-subjective relations between data-commodity and human subjects? In asking these questions, the articles in this journal seek insights into the logics of data flows between materials, things, data, code, software, interfaces and other stuff that permeates the cultures of datafication. Rather than merely mimicking the sciences' use of (big) data, the arts and humanities must explore what kind of sensorium datafication generates for things and humans. What are the implications of being data? What are the darker forces involved in capturing and using data?

In *Evil Media*, Andy Goffey and Matthew Fuller write:

> *A set of words in a report, article, or illicit data dump becomes significant in a different way when placed in a mechanism that allows or even solicits unfettered access, than when that set of words is lodged in a closed directory or laid out as a book; allowing such open access has direct and pragmatic effects on the reception of ideas, to mention just one scale at which they might be operative.*

By appealing for an unsolicited and open organisation and access to data, they implicitly highlight how datafication not only is a question of archiving and accessing data content and building information architectures of metadata. The computer is not just a medium that stores and displays but is capable of also reading and writing automatically. This affects human thinking, creativity, notions of life and death, and other relations between data and human experience.

Datafied research is both a thing and a process, and expresses a complex materiality comprised of assemblages of humans and nonhumans. The politics of data distribution are key here, in understanding how various correlations occur and causation (for a correlation does *not* mean that one thing causes the other). How does this relate to processes of individuation, to the shadowy presence of non-human readers and writers of data? A playful response to datafication points to how readers and writers by no means have become mere automatons.

In common with the transmediale call, the articles in this issue provide responses that "outsmart and outplay" the logic of capturing everything applied by the corporate as well as scientific communities (and, it seems to us that the emerging field of Digital Humanities raises as many questions as it answers in this respect). Each in their own way address this complexity, and examine datafication's connection to commodification, and even to zombification. Articles examine alternatives such as obfuscation in order to know and unknow things at different registers and scales; from the grain of data to big data, the materiality of data and the politics of data structures, or in other ways afforded by emergent practices of datafied research. Such notions lead the authors to address the many aspects of what datafication does to us, and how we might begin to do things to it.

Aarhus, January 2015

Ned Rossiter & Soenke Zehle

DATA POLITICS AND INFRASTRUCTURAL DESIGN: BETWEEN CYBERNETIC MEDIATION AND TERMINAL SUBJECTIVITY

Digital media technologies of Internet communication and software coupled with supporting infrastructures of storage and transmission have resulted in the production, sharing and distribution of knowledge and culture on scales previously unseen (and unsensed) in the history of human life. More recently, the rise of big data analytics associated with sensor technologies and the biometric monitoring of social, urban, industrial, and ecological systems has seen the empirical being redefined by algorithmic operations. It is no surprise that finance capital and new economies of exchange are both among the main drivers and beneficiaries of these developments. Spot rates, for example, are hedged against the delivery times of shipping containers in the maritime industries. Health and insurance industries are flourishing with the widespread adoption of consumer self-tracking devices and the scramble for standards designed to subsume life into measures optimised for the sale of medical products. The quantified (quantifying) self has become the exemplary subject around which the design and distribution of a wide array of knowledges on life and labour is organized.

Within this maelstrom of change, knowledge orientates itself across public and private institutions, unbound from the university and its attendant ecologies of knowledge production. But while users have come to play a central role in the reorganization of how knowledge is created, distributed and valorised, their influence on the infrastructures structuring and sustaining these knowledges has been deliberately limited by the very design logics that inform computational architectures. At the same time, the infrastructural dimension of digital economies is receiving increasing attention, from the shift to low-latency networks and centralized storage systems to the logistical technologies ensuring the synchronization of networked

activities. It is too soon to tell whether design thinking, reconceived in the systemic terms of a strategic aesthetics and freed from its all-too-close alliance with a narrow discourse of innovation, can facilitate a politically viable rearticulation of use. But for the time being, the possibility that such thought can help articulate claims to autonomy beyond the freedom to be creative at least offers a point of departure.

The current celebration of invisible design strategies claims to be the inevitable next iteration of a process that deliberately deemphasizes autonomous user agency to 'empower' ever-more efficient forms of interaction through natural interfaces. In the desire to become invisible, technology for design thinking loses interest in culture and sides with nature. In doing so, technology design — and the constitution of subjectivity it envisions — bypasses in its self-understanding the need to route its processes via the decelerationist dynamic of democratic decision-making. Instead of engaging the ethico-political consequences of the becoming-machinic of our philosophies of life and labour, we are asked to embrace the autonomization of technological developments that above all expect us to seek — if not employment — at least enjoyment in the grammatization of our active being in the world.

It still makes sense to move outward from the user, now situated and redefined as a node of multiple infrastructures. Yet rather than focusing on this networked self, or the urban equivalent of Saskia Sassen's global city, we instead see a critical purchase through analyses of how overlapping infrastructures constitute the user as a new kind of economic and epistemological subject. Such an undertaking is no longer a matter of making visible the invisible. Part of what needs to happen is an exploration of how the digital economy changes the way we understand

and constitute infrastructure. To effectively address such concerns, the need to develop a conceptual idiom capable of comprehending the scope of digital infrastructures and their economies becomes all the more apparent: from anonymous grassroots activists in support of independent media to hackers able to control industrial infrastructures, from the anonymity of high-frequency trading that complicates the analyses of financial crises to the anonymity of users who prefer to cooperate in their exodus from the world of corporate communications infrastructures.

This essay compiles elements of a conceptual architecture that consists of four key vectors of thought: *Experience math* explores the algorithmicization of everything from within a horizon that stretches beyond the digital society. *Mediations of labour* poses the question of freedom within a cybernetics of control. *Terminal subjectivity* consists of a broader engagement with machinic explorations of agency, the geopolitical horizon of the anthropocene and anthropological registers of self-constitution. *Actuality archives* registers the transformation of temporality as an index of 'experience collapse' in the age of zero latency, and the question of memory as it relates to subjectivity. As Mark Fisher observes, "In conditions of digital recall, loss itself is lost" (Fisher 2). Similarly, experience off-the-grid is also lost, it escapes regimes of measure without the harness of the archive or database. The ephemerality of experience beyond accountablity spans the class spectrum — from the wealthy elite who insist on time offline as a social right, to the economically destitute and geographically marginalised abandoned to a life without digital connectivity.

Experience math

If, as Heidegger proposed, cybernetics now takes the place of philosophy, then we might inquire into how the body and brain are enmeshed into circuits of data mediated by infrastructures of communication (Heidegger). Concept production becomes integrated with algorithmic architectures and politics is played out, in part, on the horizon of parameters, protocols and standards. The 'management cybernetics' of Stafford Beer in the late 1950s is today manifest in logistical systems of coordination, communication and control.[1] A 'numerical imaginary' is required for the workings of the brain to be tied to infrastructures of mediation (Martin). The 'foundational indeterminacies of counting' provide technocratic reason with a parametric logic that makes both matter and experience calculable entities. Despite the determining architecture of algorithmic capitalism, there is, as Reinhold Martin notes, also a variational scope to numbers grafted to matter. Numbers don't always stick. In the case of the logistical fantasy of seamless interoperability across global supply chains, numerous conflicts emerge at the level of protocols, sabotage, labour disputes, excess inventory, and so forth.

Such variables comprise the properties special to what Keller Easterling defines as the *disposition* — a 'tendency', 'capacity' or 'propensity' — of infrastructure space (Easterling 71-93). The mathematical grammar that underlies algorithmic architectures, in other words, should not be seen as totalizing in force, even if it does hold a determining capacity to shape outcomes, including how experience is modulated and made productive within digital economies. Rather than assuming at the outset that forms of agency that cannot be folded into a politics of representation lie beyond the scope of the

political, part of the question of a data politics is how we engage the disposition of these new technical systems in ways that acknowledge the actuality of machinic agency.

Alexander Galloway has suggested that "[t]he economy today is not only driven by software (symbolic machines); in many cases the economy is software, in that it consists of the extraction of value based on the encoding and processing of mathematical information" (Galloway 358). When "software is math" and "calculations, math, algorithms, and programming are precisely coterminous with quotidian experience", the question of the computational is a question of agency: "one cannot be *neutral* on the question of math's ability to discourse about reality, precisely because in the era of computerized capitalism math itself, as algorithm, has become a historical actor" (358, 360, 362). Since the critique that the informatization of cultural processes occurs at the expense of our capacity to experience has been with us since what used to be called the 'scientific revolution', current concern regarding the algorithmicization of everything is perhaps best explored from within a horizon that stretches beyond familiar accounts detailing the emergence of the digital society (Roux). To comprehend algorithmicization as mathematization is to reframe the question of math's agency in terms of cultural technique rather than the more limited horizon of the digital society.[2] Today, the mathematization of culture is registered in the new metrics of our communicative practices and our modes of relation in which data is produced, extracted and accorded the potential of exchange value.

Mediations of labour

To couple freedom with and against cybernetic systems of control is both a technical-conceptual tautology and anathema to those opposed to one of the key tenets of liberalism. The dream of cybernetics is to free capital from the burden of labour-power, not to establish workers as prototypical users positioned to co-determine the disposition of semi-autonomous technical systems. The cybernetic socialism of Allende's Cybersyn in Chile, designed by a team led by Beer in the early seventies, was implemented on IBM 360 mainframe architecture over a three to four month period. The intention was to liberate workers from the strictures of Taylorism, bringing labour into the process of economic governance (albeit in the form of cybernetic feedback).[3] Yet we learn in the notable study of Eden Medina, along with the omissions in Evgeny Morozov's now notorious review of that study, that the 'viable systems model' underpinning Project Cyberstride – in which real-time updates of production data from the factory floor to management and government decision makers — did not give workers any say in designing the economy (Medina 70-71).[4] For all the good intentions of technologists to 'incorporate mechanisms for worker participation and ways to preserve factory autonomy within a context of top-down government control', the history of Project Cybersyn indexes the black box politics of infrastructural systems as they intersect with prevailing ideologies of sovereign power (Medina 212, 215). It also illustrates that the desire to embed ethico-political principles in system design cannot but remain enmeshed with the political struggles of the day.[5]

Access to data flows of cybernetic systems is one key issue related to the collective design of data infrastructures. How to invent infrastructure decoupled from ideology is to

suppose an ontological design that speaks to the 'purity' of the technical object itself, as though that is ever independent of the epistemological conditions from which the object arises. The digital object (apparatus) may foreground itself as a device through which communication, economy, subjectivity and labour is enabled and thus evoking a *proximity of distance* (Kittler 302). But its mediating force is predominantly numerical and thus abstracted vis-à-vis the design of algorithms that calibrate, store and extract value from the work of experience.

To acknowledge the structural transformation of the technical object — its dispersal into technical networks — shifts attention from media to mediation:

> *The concept of the technical object has itself become, because of its fundamental environmentalization, problematic, if not obsolete […] In contrast to the ever-repeated refrain of a new immediacy, into which we (re)enter in the age of ubiquitous computing, ubiquitous media, intelligent environments, and so on, we are in fact now dealing with the absolute prioritization of mediation. (Hörl, 124)*

It is no accident that the thought of mediation continues to draw on the catholic visions of Marshall McLuhan. While "Kittler believed that media *determine* our situation, McLuhan thought that media are our situation," observes W. J. T. Mitchell in a recent journal issue dedicated to the 50th publication anniversary of McLuhan's *Understanding Media: The Extensions of Man* (Mitchell 90). As Mitchell and Mark B. N. Hansen note elsewhere, "Before it becomes available to designate any technically specific form of mediation, linked to a concrete medium, *media* names an ontological condition of humanization — the constitutive operation of exteriorization and invention" (Mitchell and Hansen xii). Which is why "media studies can and should designate the study of our fundamental relationality, of the irreducible role of mediation in the history of human being" (xiii). Moreover, "One of the key implications of thinking of media (tools, artifacts, code, etc.) rather than language as constitutive of human life is that the assumption that the human is metaphysically distinct from other forms of life is called into question" (xiv). A focus on mediation both implies that individual user experience comes into view as (human) species experience and calls the distinctiveness of that experience into question.

As in the analysis of cultural techniques that shift the focus from signification to the performative, pragmatic, and processual registers of semiosis, the focus on mediation shifts attention from the production of meaning to the processes of material constitution. Such an approach makes clear the ways in which data emerges from the 'work of the soul' in which value is extracted from the surplus of the common (Berardi 358). But it also points to the agency of math to generate data and value independent of the human subject. The materiality of numbers takes us back to the mediating power of infrastructure. When algorithms and the materiality of server farms become primary in the generation of value we can assume the efficiencies of the human have obtained a threshold upon which no further — or at least minimal, if not insufficient — value can be exploited. But does this mark an end to the living labour in soul work or its utopian liberation thanks to the automation of the machine? For the immediate future, capital remains on course to mine value from the datafication of human activity, organic and inorganic life. And even if such economies are still limited in terms of the exchange and profit generated directly, they have already redefined the way we talk about the infrastructures of life and labour.

Terminal subjectivity

The ontology of data subsists in the link between the machinic semiosis of capitalism analyzed by Maurizio Lazzarato and an anxiously Stieglerian focus on the structural transformation of memory as that which anchors subjectivity as we know it. Following Deleuze and Guattari's antisociological stance, Lazzarato suggests that the distinction between 'dead' and 'living' labour "is appropriate only from the point of view of social subjection" because "[m]achinic enslavement (or processes) precedes the subject and the object and surpasses the personological distinctions of social subjection" (Lazzarato 120). Living labour can no longer be assumed to serve as horizon of emancipation: "Self-realization, identity formation, and social recognition through work have always been at the heart of the capitalist – and socialist – project itself" (121). What remains is the reorganization of the 'logic of existentialization' (Guattari), including these non-human vectors of subjectivation, through a parametric politics that engages new sites of struggle within the horizon of algorithmic capitalism. Cybernetics no longer looms as sublime horizon of freedom but lurks as an anonymous apparatus of capture within Lazzarato's analysis of 'machinic enslavement'.[6]

For Bernard Stiegler, the exteriorisation of memory — its spatial properties and technical qualities — operates as "an interface between the psychic and the social" (Stiegler). The crisis of subjectivity and knowledge Stiegler attributes to the force of digital technology on the collective individuation of memory, cognition and the constitution of sociality is troubled by an *ur*-subject that has been unravelling since the time of the ancient Greeks. Rather than lament the passing of pre-Socratic thought, we find

greater urgency in discerning how designing infrastructure rates as a core issue in the politics of data.[7]

Mark Andrejevic is correct to note that: "It will not be enough, however, to gain control over the infrastructure of our communicative lives" (164). The social-political capacity for such a reversal of infrastructural power is highly unlikely to scale in a way that challenges the combined state and commercial interests that dominate the ownership and development of communications infrastructure. Yet to identify and critique the organization of power coincident with algorithmic capitalism is to register an instance of social and disciplinary transformation. This also holds implications for the production of subjectivity. At stake for Andrejevic is not just a reimagination "of infrastructural arrangements, but also the knowledge practices with which they are associated" (165). The work of knowledge production requires both technical and conceptual-imaginary resources that intersect with, and indeed constitute, the experience of labour and life.

Archiving actuality

In the real-time archive of our everyday communication practices, it is not the past which is forgotten, but the present. The Chilean experiment in cybernetic governance, as discussed by Medina, returns us to the question of the political design of infrastructure. We propose a practice of machinic making, of a making that acknowledges the centrality of design as an upstream rather than downstream activity, and that explores the growing significance of machinic modes of communication in the mediation of work. Design, or a reclaimed and repoliticized vision of design thinking as a strategic aesthetics, is above all a research method, a

form of analysis that takes 'making' beyond its nostalgic embrace of manual labour into a form of comprehension that acknowledges (and takes advantage of) the actuality of subjective constitution.

To think Stiegler (and Simondon) in relation to data is to shift our attention to database design. And if the *Gestell* is morphing into a data fabric, we need to start thinking about how it implicates us in hybrid becomings, comprehending the processuality of its own constitution and the computational topologies of the space of experience. We can say that, somewhat ironically, the enormous visibility of idioms both of design thinking and making is itself in need of explanation rather than simply of affirmation: it is time to no longer celebrate such practices as a renaissance of a new critical manualism and reawakening of a political procedurality, but rather to look at the way they reconfigure the idea of participation, of use, of active being in the world beyond anti-political visions of solutionisms and social innovation. As Trebor Scholz reminds us of sharing economies, "Today, nothing remains outside of labor." For all the valorisation of artisan localism in much maker culture, the functioning of maker economies is frequently underpinned and made possible by the algorithmic apparatuses that coordinate global supply chains. A politics of data could begin with making visible the labour dimension that underscores the production of value, which is no less the case in the archive-based automation of social and economic life.

Whether through an opening of the techno-governmental archives of big data, or through the design of experimental institutions like archives of political dissent, we already mobilize our new aesthetico-algorithmic literacies in the work of collaborative constitution and the mediation of memory for social-political movements.[8] The weight of these archives may not decelerate real-time flows to the extent that they can easily be subjected to new forms of collaborative self-determination, but that is perhaps less important than we have assumed. At least we can, taking further our interest in the infrastructural registers of our ways of being in the world, rearticulate our will to connect from within a horizon that acknowledges the specificity of the computational conjuncture. Needless to say, we see an urgency to do so, at least as long as the subjective economy is fuelled by the data exhaust of semiotic machines. Without such collective undertakings and encounters with the computational conjuncture, the politics of privacy derived from rights to expression and informational self-determination will not even begin to be able to comprehend the stakes of a politics of data.

Notes

[1] On 'management cybernetics', see Pickering (9). See also Medina (24-29).

[2] In his survey of the (re)emergence of *Kulturtechnik* as a media-theoretical concern, Bernard Dionysius Geoghegan concludes that "media genealogists must ask how, and under what conditions, cultural techniques strategically and temporarily consolidate these forces into coherent technologies" (Geoghegan, 79). See also Parikka, and Winthrop-Young.

[3] As Claus Pias notes: "[…] the charts of happiness were to be broadcasted live to the Opsroom, and that similar feedback loops were to be installed in factories, in order for the workers to be able to observe themselves, the bosses to observe the workers, the workers to observe the bosses, and the bosses to observe the bosses. For the eudaemonist Beer, this mirror maze of observation, this uninterrupted relationship controlling, which elsewhere (though at the same time) has been called 'societies of control' (Deleuze 1993), was a promise of happiness. Freedom, according to Beer, is not a normative question, but 'a computable function of effectiveness […] the science of effective organisation, which we call cybernetics, joins hands with the pursuit of elective freedom, which we call politics' (Beer 1973: 16, 23)." See Pias.

[4] See also Morozov.

[5] On the gendered design of control room interfaces and its relation to state power, see Medina (217).

[6] Siegert makes clear the conceptual implication of thinking cybernetics in relation to media and the human subject: "Within the framework of cybernetics, the notion of 'becoming human' had as its point of departure an anthropologically stable humanity of the human that endured until increasing feedback systems subjected the 'human' to increasing hybridizations, in the course of which the 'human' turned either into a servomechanism attached to machines and networks, or into a machine programmed by alien software (see Hayles). By contrast, French (and German) posthumanism signalled that the humanities had awakened from their 'anthropological slumber'. This awakening, in turn, called for an anti-hermeneutic posthumanism able to deconstruct humanism as an occidental transcendental system of meaning production. For the Germans, the means to achieve this goal were 'media'. The guiding question for German media theory, therefore, was not *How did we become posthuman?* but *How was the human always already historically mixed with the non-human?*" (Siegert, 53).

[7] Friedrich Kittler famously revisited the Sirens only to find that Odysseys had (of course) lied (at least to his wife). To hear what they say (and sense what they desire), one actually had to steer the boat of *Dasein* a little closer to the beach of being. Kittler still sought in this gesture a profound source of inspiration to think the futurity of contemporary Europe. So if we wanted to engage this Heideggerian lament in its relationship to contemporary configurations of the political, at least let's do so by way of a substantial detour through the current 'scandal' following the publication of Heidegger's *Black Notebooks*.

[8] See, for example, the collective archive of MayDay Rooms, <http://maydayrooms.org/>.

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Renée Ridgway

PERSONALISATION AS CURRENCY

Capital burns off the nuance in a culture. Foreign investment, global markets, corporate acquisitions, the flow of information through transnational media, the attenuating influence of money that's electronic […] untouched money […] the convergence of consumer desire (DeLillo 785).

'Cybercapitalism', commonly termed 'digital capitalism', refers to the Internet, or 'cyberspace' and seeks to engage in business models within this territory in order to make financial profit. Both cybercapitalism and cyberspace refer back to the etymology of their prefix, cyber, from the Greek 'kybernetes' (cybernetics) meaning science, governance, or stewardship, yet the inherent complexity of cyberspace reflects communication between peoples, societies and cultures in virtual reality. With the application of media technologies, social interactions occur in "the place between" or "the indefinite place out there" (Sterling 11) where people interconnect and navigate through computational networks. Drawing upon the metaphor of a wider cyberculture in literature, cyberspace alludes to information streaming across a borderless world of "unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data" (Gibson 69).

However hierarchies do exist in cyberspace, the same infrastructures that prohibit access for some people enable 'cybercapitalism' to take hold. Not just streams of social communication but flows of money faster than the speed of light constitute a globalised world of commerce. "The predominant economic model behind most internet services is to offer the service for free, attract users, collect information about and monitor these users, and monetize this information" (Mikians et al 1). We search, tweet, post, blog and upload – giving away our words, thoughts, images and intimacies. As a consequence of 'the network effect' more people contribute online because others also choose to do so, causing the value and power of the network to increase exponentially as it grows (Leach). This donation of data is reciprocated in the form of power constructs by the private sector (Google, Facebook, Twitter, Yahoo). Google, for example, is dependent on users willingly furnishing data that is then filtered, as value is simultaneously extracted from the data. This enables Google to have a completely free database, and by designing specific algorithms that are able to index and crawl the Internet, they provide 'relative' results.

Cybercapitalism is structured by a highly intricate series of communication networks, which connect us through our participation on social platforms, but outside of these platforms how do we navigate and explore this information superhighway? We do so predominantly through search requests. Algorithms ostensibly know what we want before we even type them, as with Google's 'autocomplete'. Thus search is not merely an abstract logic but a lived practice that helps manage and sort the nature of information we seek as well as the direction of our queries. Google's 'PageRank' (Page, Brin) is based on hyperlinks and has emerged not only as an algorithm for sorting and indexing information on the world wide web but also as a dominant paradigm that establishes the new social, cultural and political logics of search-based information societies – a phenomenon that Siva Vaidhyanathan characterizes as the "googlization of everything" (20). Whether search will become more semantic or contextual, including understanding what words mean and their intent or how they relate to other concepts, is currently under research and development. However, as of writing, Google is the world's most used search engine, answering 3 billion requests per day (Wikipedia). The implications of this

hegemony in regard to questions of identity, free speech, control, mobilization and so on, should not be underestimated.

To put a limit on response time, once a certain number (currently 40,000) of matching documents are found, the searcher automatically goes to step 8 in Figure 4. This means that it is possible that sub-optimal results would be returned. We are currently investigating other ways to solve this problem. In the past, we sorted the hits according to PageRank, which seemed to improve the situation.

4.5.1 The Ranking System

Google maintains much more information about web documents than typical search engines. Every hitlist includes position, font, and capitalization information. Additionally, we factor in hits from anchor text and the PageRank of the document. Combining all of this information into a rank is difficult. We designed our ranking function so that no particular factor can have too much influence. First, consider the simplest case -- a single word query. In order to rank a document with a single word query, Google looks at that document's hit list for that word. Google considers each hit to be one of several different types (title, anchor, URL, plain text large font, plain text small font, ...), each of which has its own type-weight. The type-weights make up a vector indexed by type. Google counts the number of hits of each type in the hit list. Then every count is converted into a count-weight. Count-weights increase linearly with counts at first but quickly taper off so that more than a certain count will not help. We take the dot product of the vector of count-weights with the vector of type-weights to compute an IR score for the document. Finally, the IR score is combined with PageRank to give a final rank to the document.

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1. Parse the query.
2. Convert words into wordIDs.
3. Seek to the start of the doclist in
   the short barrel for every word.
4. Scan through the doclists until
   there is a document that matches
   all the search terms.
5. Compute the rank of that
   document for the query.
6. If we are in the short barrels and at
   the end of any doclist, seek to the
   start of the doclist in the full barrel
   for every word and go to step 4.
7. If we are not at the end of any
   doclist go to step 4.
   Sort the documents that have
   matched by rank and return the top
   k.

Figure 4. Google Query Evaluation
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Figure 1: Excerpt from "The Anatomy of a Large-Scale Hypertextual Web Search Engine", Page and Brin (1999), p.12.

Are most users aware of the hidden control of search algorithms and how they affect obtained results, whether for the production of knowledge, information retrieval or just surfing? Since December 4, 2009, Google uses 'personalisation' where it captures and logs users' histories and adapts previous search queries into real-time search results, even if one is not signed into a Google account. This search engine bias retains user data as algorithms gather, extract, filter and monitor our online behaviour, offering suggestions for subsequent search requests. In exchange for our data we receive 'tailored' advertising, making things fit, turning ourselves into commodities for advertisers and receiving free Internet usage. As we search every day, many users allow this personalisation to occur without deleting the cookies or installing plug-ins that would inhibit it. This personalisation becomes a currency in the online marketing of our data.

We enable this form of voluntary 'personalisation as currency' with our data or, in the words of venture capitalists, 'powerful information', by participating in online activities.

The selling of our individual desires, wants and needs to large multinational corporations on the internet was already articulated by 'Humdog' in her prescient text from 1994, *pandora's vox: on community in cyberspace*, where she argued that computer networks had not led to a reduction in hierarchy but rather a commodification of personality and a complex transfer of power and information to companies (Hermosillo). By remitting all of this information to corporations (Google, Apple, Facebook, Amazon) we receive the benefit of supposedly incredible recommendations. Nowadays it has become clear that users pay with their data, which is increasingly the means to finance various corporations' growth as they sell this data to third party advertisers. It is a transaction and in the exchange we get relevance. But is this really true?

Aestheticisation of personalisation

Perhaps our futures are bound now inextricably by two works of literature. Orwell declared with 1984 *that we will be destroyed by the things we fear and we will have a surveillance state whereas Aldous Huxley in* Brave New World *claimed that we would be destroyed by the things that delight us. We now have the Orwellian surveillance companies who produce the things we really like: social networking, cloud computing, free email, iPhone, all in one package and all in one generation. (Leach)*

In the recent film by Spike Jonze, *Her*, it is not the operating system called Samantha that captivates Theodore, the film's main protagonist, but Element Software, the company
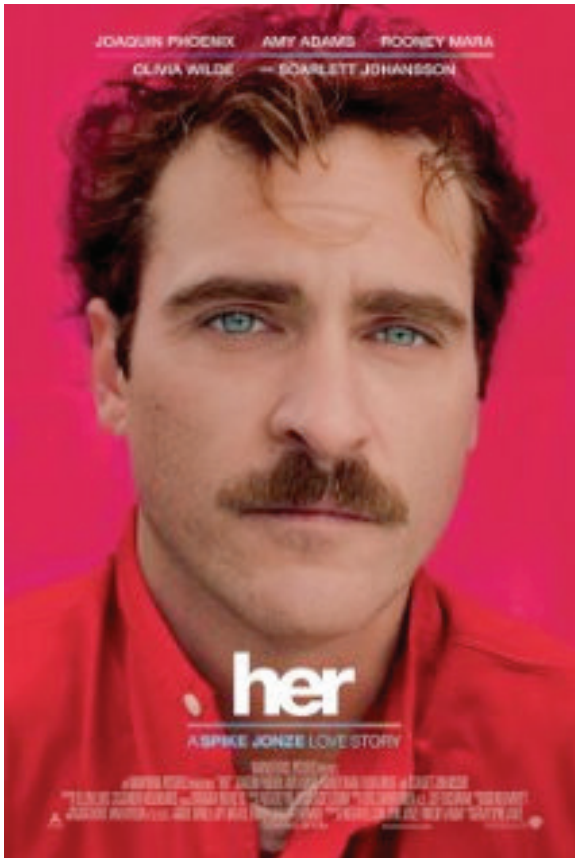
Figure 2: Poster for the film *Her* by Spike Jonze

where Theodore purchased Her. "In Jonze's all too plausible dystopia, we are enslaved not to robots but corporations, and the invisibility, even desirability of that enslavement is what makes *Her* so chilling." (Farago).

The hidden aspect of corporate control is not something new; advertising has successfully drawn on the emotions of consumers to create brand loyalty and sell products for some time. In the here and now all forms of psychology are applied to coerce us to buy things we don't need and the process behind how we are manipulated remains hidden. Advertising agencies incorporate users' wants and desires as they capture the data and then attempt to predict what the audience will consume. Most people enjoy the recommendations that they receive from Amazon or suggestions based upon what their friends like on Facebook. This is the power of suggestion at work. The efficacy

with which Google delivers (popular) results when we type in keywords enforces its dominance. Google earns 96% of its profit from advertising.[1]

Technology and how it controls our attention is emerging as a 21st century zeitgeist. However certain information on the Internet is kept invisible and obscured, thus we are deterred from learning about things we do not already know. Eli Pariser's *The Filter Bubble* reminds us that the information age not only spews data but also creates a sense of deprivation. This leads to the 'distortion effect', one of the challenges posed by personalised filters.

> *Like a lens, the filter bubble invisibly transforms the world we experience by controlling what we see and don't see. It interferes with the interplay between our mental processes and our external environment. In some ways it can act as a magnifying glass, helpfully expanding our view of a niche area of knowledge. (Pariser 82-83)*

At the same time, these filters limit what we are exposed to and therefore affect our ability to think and learn. In this way, personalisation has legitimised an online public sphere that is manipulated by algorithms.

Semantic capitalism

> *We don't want to know everything about you. What we want to do is to try to help to connect you with the peoples, ideas, and things you are looking for. You decide which information you decide to give to us. It is a utility that improves if you decide to share information. (Google spokesperson)*

Google states above that the more users share information, the higher the relevance of search results they will obtain. In order to test this statement, Martin Feuz, Matthew Fuller and Felix Stalder designed the empirical study, *Personal Web Searching in the Age of Semantic Capitalism: Diagnosing the Mechanisms of Personalisation*. Published on the *First Monday* blog in February 2011, the research was carried out with great difficulty in the preceding years. Google interfered with the testing while it was being conducted by blocking IP addresses and adding personalisation. The study began with the premise that not all users are looking for the same information when they type in a keyword and therefore the quality of search results is decreasing. In order to combat this problem search engines (Google in particular) had been working on ways of obtaining better search results for the user, one of these being personalisation. The study began first by assigning identities (one Gmail email account per user) for Immanuel Kant, Friedrich Nietzsche and Michel Foucault, representing the 18th, 19th and 20th centuries respectively, along with diverse vocabularies representing their likely search keywords and then programmed thousands of search requests from the same server in London.
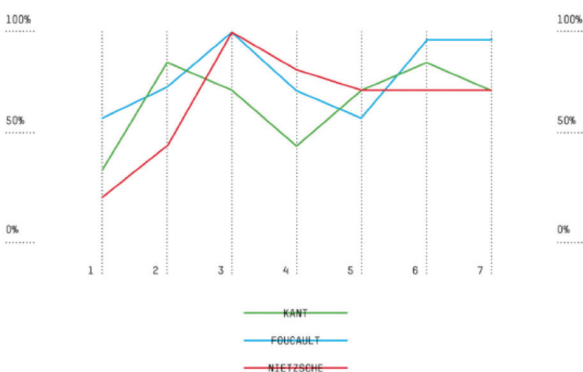

Figure 3: Infograph Hypothesis 3.

For this empirical enquiry they tested three ways of profiling, as it was assumed Google does something similar in order to produce personalised search results, and by doing so developed new digital methods. The three types of profiling were labelled as 'the knowledge person', 'the social person' and 'the embodied person'. The first looked at what people are interested in, based on search histories. The second looked at networks and who the person is connected with using email, social networks and communication technology. The last looked at the environs of where the person is located and their bodily state. By merging the three profiles Google promised to deliver relevant search results for each individual user, where the machine interprets the user's behaviour and decides what is relevant for the user.

Their findings suggest that Google's personalised search, "does not fully provide the much-touted benefits for its search users. More likely, it seems to serve the interest of advertisers in providing more relevant audiences to them" (Feuz, Fuller, Stalder). What can be drawn from the research is that the benefits of personalised search goes to the advertiser, thus Google has sold us, the audience, to them. Google draws on the well-known business model of television, which involves giving away content for free in order to attract an audience, who are then sold to advertisers who have paid the TV channel for time. Yet Google does not stream the same ad to its billions of users and users do not type in the same query. Instead they deal in targeted advertising. This exchange provides search results to users and sells users to advertisers. Also of importance is that this study produced the first evidence that:

> *Google is actively matching people to groups, which are produced statistically, thus giving people not only the results they want (based on what*

Google knows about them for a fact), but also generating results that Google thinks might be relevant for users (or advertisers) thus more or less subtly pushing users to see the world according to criteria pre–defined by Google. (Feuz, Fuller, Stalder)

This type of 'collaborative filtering' continues today with machine-learning algorithms as the amount of data captured and correlated increases exponentially.

Hidden infrastructures

In 1967 advertising executive Robert MacBride's *The Automated State* already described modern computer systems that would produce "a bureaucracy of almost celestial capacity" that can "discern and define relationships in a manner which no human bureaucracy could ever hope to do" (MacBride qtd. in Morosov). In his book *Protocol*, Alexander Galloway exposes the hidden infrastructures that enable the Internet to function, drawing on TCP/IP, DNS and HTML and arguing that code is a natural language that can be analysed like any other. If the Internet enables communication between people it is also the greatest surveillance machine ever invented. Control is exercised through covert operations that include surveillance but is not limited to the form of the panopticon. Rather, according to Wendy Hui Kyong Chun in *Control and Freedom: Power and Paranoia in the Age of Fibre Optics*, "The problem is not with the control protocols that drive the Internet — which themselves assume the networks' fallibility — but rather with the way these protocols are simultaneously hidden and amplified." (6)

Search algorithms crawl vast amounts of data and organise it according to, for example, what the advertiser has paid the programmers of algorithms to find. As they sort through the data a hyper-complex infrastructure of daily search requests emerges. We cannot, however, see the mechanisms of how our searches are manipulated by the assumed 200+ proprietary algorithms employed by Google. Search is thus a 'hidden organisation' — or a hidden organising process that keeps its secrets of control sequestered from the user. The act of concealment, when we hide and do not want to participate, could be considered an act of critique. In other words, being so overt that we are covert might be the only way to escape capture. "But when do we reach a point where not using them (corporate algorithms) is seen as a deviation — or, worse, an act of concealment — that ought to be punished with higher premiums?" (Morosov)

4.1 Google Architecture Overview

In this section, we will give a high level overview of how the whole system works as pictured in Figure 1. Further sections will discuss the applications and data structures not mentioned in this section. Most of Google is implemented in C or C++ for efficiency and can run in either Solaris or Linux.

In Google, the web crawling (downloading of web pages) is done by several distributed crawlers. There is a URLserver that sends lists of URLs to be fetched to the crawlers. The web pages that are fetched are then sent to the storeserver. The storeserver then compresses and stores the web pages into a repository. Every web page has an associated ID number called a docID which is assigned whenever a new URL is parsed out of a web page. The indexing function is performed by the indexer and the sorter. The indexer performs a number of functions. It reads the repository, uncompresses the documents, and parses them. Each document is converted into a set of word occurrences called hits. The hits record the word, position in document, an approximation of font size, and capitalization. The indexer distributes these hits into a set of "barrels", creating a partially sorted forward index. The indexer performs another important function. It parses out all the links in every web page and stores important information about them in an anchors file. This file contains enough information to determine where each link points from and to, and the text of the link.
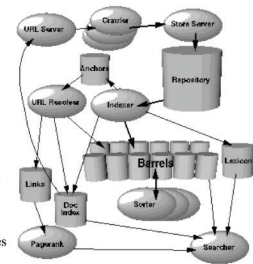
Figure 1. High Level Google Architecture

Figure 4: Excerpt from "The Anatomy of a Large-Scale Hypertextual Web Search Engine", Page and Brin (1999), p.12.

In an era of Big Data (Mayer-Schöneberger and Cukier), where information about everything and everyone is collated and gathered, it is only the machines that can process all of the data and what is visible will only be translatable as correlation. Antoinette Rouvroy's assertion that "with big data we have the impression that knowledge

is not constructed anymore", suggests a transformation in the field of visibility in which not everything will be allowed to be utterable. "All we need is the automatic, a processing of algorithms on huge databases in order for knowledge to surface, as if by magic?" (Rouvroy, *Society of the Query #2*). It is already there, hidden in huge databases, however it is signified through calculation, in the form of data visualizations and data statistics. Datamining operates according to a new statistical practice where notions of causality have given way to correlations as computer systems aggregate data from different entities and synthesize the information in order to identify patterns of behaviour and predictive assessments.

Data behaviourism

What we experience then is a new truth regime, what Rouvroy calls 'data behaviourism', "anchored in the purely statistical observations of correlations (independent from any kind of logic) among data collected in a variety of heterogeneous contexts" (Rouvroy, *The End(s) of Critique* 8). Although predictive personalisation has been shown to tailor recommendations to specific users based on search histories, as demonstrated by previous empirical studies, personalisation offers suggestions to the user based on their past preferences which have been assigned to groups. "A query is now evaluated in the context of a user's search history and other data compiled into a personal profile and associated with statistical groups" (Feuz, Fuller, Stalder). Based on buying habits, search histories and so on, the user is first classified and assigned according to demographics, not as an individual, rather with mass personalisation. Behavioural targeting schemes use analogous technology by collating data to define 'audience segments', dependent on users with similar profiles.

Significance becomes calculable without signification and therefore rendered meaningless. This unseen structure has become an increasingly prominent issue in the way we seek knowledge, not only from an epistemological point of view, but also with regards to how this infrastructure orders and classifies knowledge in taxonomies of computable data. 'Welcome to the City of Discipline' (Foucault) where we govern ourselves through our 'behaviours' being captured and cultivated in 'personalised' machines, sharing everything we do as huge amounts of data, surrendering our privacy for free services and participation in the attention economy. This state of discipline is reflected in the logistical capture of our data, preferences, intimacies and search queries as our subjectivity is exploited in these deterritorialised spaces.

The environs of digital labour are subject to what Félix Guattari termed 'deterritorialisation' describing how the classic Fordist modes of production have moved from the factory to the Internet and have lost their 'territorial identity' (Lazzaroto 16). The disciplinary societies of the 18th and 19th centuries transcended sovereignty and were instead spaces of enclosure defined by families, schools, barracks, factories and possibly hospitals or prisons (Foucault, qtd. in Deleuze 1). In the 19th century nation states were constructed because capitalism had become deterritorialised through colonialism and the industrial revolution. The 20th century saw the dawn of the society of control as, after WWII, liberating *and* enslaving forces confronted one another as the factories were replaced by corporations (Deleuze 4). Now this control is modulated through code and, in order to survive, capitalism brings deterritorialisation back to individualisation, placing individual initiative in the foreground.

Everyone is required to become an entrepreneur selling one's own brand of 'creative' activity, leaving our traces of data everywhere. It is then the entrepreneur, embodied as both producer and consumer (prosumer), whose behaviour and daily online activities are monitored by algorithms. The technological advancement of instant communication through email, VOIP, comment writing, posts, likes and visits to websites, comprise not only knowledge production but also telecommunications. The concept of subjectivity produced by this reproduction of communication is what underlines Post-Fordist activities. The new technologies invest in human subjectivity through social networks and user-generated content and therefore differ from those of the industrial era. The subject is the consumer and this consumption is captured in the net of big data. Deleuze's profound description of capitalism in the control society in which services are sold and stocks bought, finds that "individuals have become 'dividuals' and masses, samples, data, markets, or banks" (Deleuze 5). Where has agency gone when our subjectivities are objectified, reified, datafied and commensurated?

Source: Bain & Company

Figure 5: The Personal Data Ecosystem: A Complex Web from Data creation to Data consumption.

Data as an asset class

In a digital economy that bids farewell to the client and welcomes instead the user/ collaborator (prosumer), the personalisation of searches has become commonplace, while the infrastructures that enable these protocols remains hidden. With personalised search, our subjectivity is correlated through algorithmic technologies as our personal information (data) is acquired by marketers, or third parties.[2] The serendipity of searching online ended with personalisation. Now we search through hyperlinks in Twitter, social media platforms and apps as the exponentially increasing usage of mobile phones enables 24/7 connectivity. As search migrates from desktop computers and social media to mobile phones, the integration of mobile operating systems with the web ensures that we become ever more entrenched in the filter bubble.

Instead of supplying our data, we could be hiding it, or in control of it, and therefore need not give it away in exchange for free service. Well-designed browser extensions such as *Ad Nauseum* "obfuscate browsing data and protect users from surveillance and tracking by advertising networks".[3] Working in conjunction with Ad Block Plus,[4] an open source plug-in that removes ads whilst browsing, this intervention clicks and likes *all* ads, concomitantly visualizing the ads over time. By "clicking ads so you don't have to", it addresses the lack of standards for tracking, privacy issues, user profiling and "excessive universal surveillance" (Nissenbaum, Howe, Zer-Aviv).

The development of applying search algorithms to various calculation models in advertising, risk calculation and crawling vast amounts of data comes from within the industry itself. Employing machine learning, search algorithms that can handle dynamic
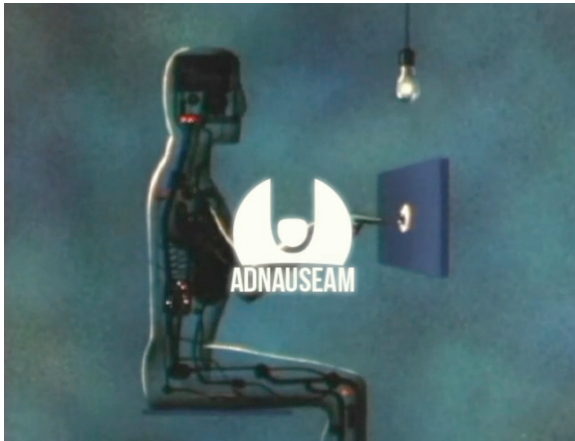
Figure 6: *AdNauseum.*

large-scale data variables ad-infinitum, to enhance the scoring of the subprime population with regard to consumer credit was one of these innovations. The more signals, generating an expansive big data model, the better the ability to underwrite or determine the creditworthiness of an individual to receive financial support (for insurance, mortgage, credit, and so on).[5] Ostensibly the calculation is based on personal data, never knowing when to begin or for that matter where to stop with the collation of data because, "all data is credit data, we just do not know how to use it properly" (Merrill, "Alle Daten sind Kreditdaten"). Privacy is becoming more difficult to protect and anonymisation has almost become obsolete as individual consent is reduced to 'agreeing' to the Terms of Service. Many consumers remain unaware of the specific nature of these data collection activities and do not exercise their rights to access, opt out or delete 'their' data. With big data techniques value resides not in its primary purpose but rather in innovative, secondary uses that were not even imagined when it was first collected (Mayer-Schönberger and Cukier).

The issue is not just one of data's contemporary use value but of its value as a future investment. The monetization of data is presently a $156-billion-a-year industry for the data brokers and the companies who trade in such commodities (Pasquale). Sometimes data is transacted at a few cents per name, or insurance companies use it to calculate premiums. For some brokers of personal data pricing is based on the attributes of individual accounts, ranked high, medium or low, these are currently the data attributes regarding a person's spending habits.[6] Organisations such as the OECD are well aware of the value of data in the information economy and the benefits and costs of disclosed and protected data (Acquisti 4). "As some put it, personal data will be the new 'oil' — a valuable resource in the 21st century. It will emerge as a new asset class touching all aspects of society." (World Economic Forum, 5) Data is the 'raw' material of business; markets will be created with this data (Mayer-Schönberger and Cukier). We are then the greatest asset, reflected by personal data. Determining if the ownership of this data belongs to the subject, who will have the access to this 'natural resource', along with the recycling of this raw material, remains an open-ended debate.
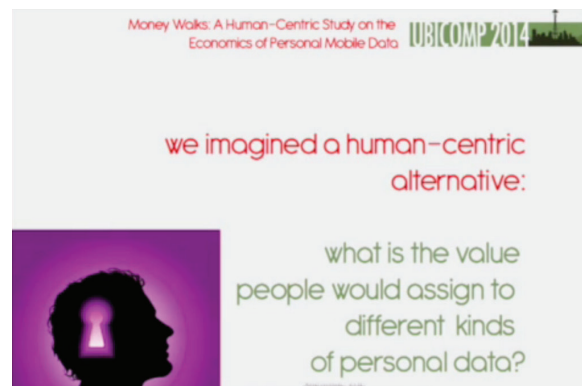

Figure 7: Money Walks.

In the recent article, *Money Walks: A Human-Centric Study on the Economics of Personal Mobile Data*, the authors investigated the monetary value that participants assigned to different kinds of PII (Personally Identifiable Information), which was collected by their mobile phone, including location and communication information, focussing only

on web-browsing (Staiano et al 1). Over a period of 60 days, qualitative surveys were conducted along with analysis of behavioural attitudes towards sharing and the value attached to this activity. These were divided into four categories: communications, apps, location, media — and then exacted. In their study they found that communication data was more saleable compared to locative data, which accrues more value the greater the distance travelled. "Several participants also expressed that they did not want to be geolocalized and considered location information to be highly sensitive and personal" (Staiano et al 10). Concerning the economic valuation some participants would allow access to their data if they were well paid, while others less concerned with privacy would exchange it for a few cents.[7] "The overall median bid value in the study was ~x = € 2" (Staiano et al 9). However, in reality, people give away their data to companies all of the time. Notably, participants who exercised intentional control when disclosing personal information were more aware of the monetary value of their data. Another important conclusion that could be drawn from the study was the issue of trust. Participants were asked who they would trust to handle their information and to order the following entities from most to least trusted. Individuals overwhelmingly (.997) trusted themselves the most with their personal data, followed by banks (.537), telcos (.513), government (.49) and insurance companies (.46). The authors conclude by suggesting the adoption of a decentralised and user-centric architecture for personal data management (Staiano et al 8).

Trading in privacy for personalisation and convenience has become the default modus operandi as the tools we use every day, from smartphones to search engines and websites, capture our personal data. This data is traded, reused, repurposed, auctioned off, sold and resold. Obviously

our data has value to many third parties who know how to use it but who owns 'our' data? Whether we will be coerced into negotiating our rights to its retention, enact the "right to be forgotten" or be forced to make a living selling our data instead of giving it away, has yet to be determined. The question of what our data is actually worth to us remains open.
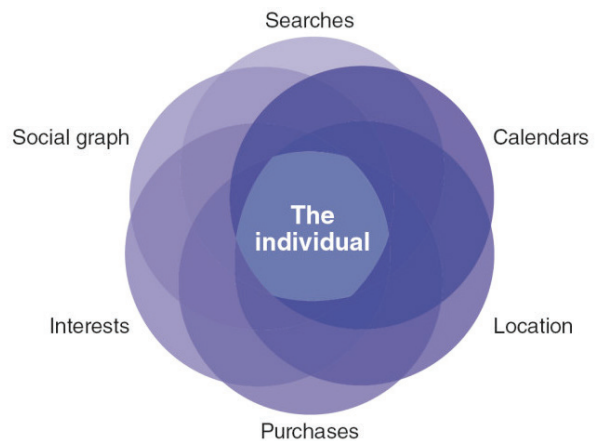

Figure 8: Individual end users are at the center of diverse types of personal data. Source: "Rethinking Personal Information - Workshop Preread." Invention Arts and World Economic Forum, June 2010.

Notes

[1] Although Adwords is relevant to the monetization of search queries and Google's greatest source of revenue, it is beyond the scope of this short article to go into greater detail. However, the recently launched Google Contributor enables one to pay monthly fees so as not to see ads, although at the moment by invitation only. <https://www.google.com/contributor/welcome/>

[2] In the latest update for Apple's operating system Yosemite, the default setting is to upload users' search terms in 'Spotlight' directly to their servers. If enabled, both 'location services' as well as 'commonly searched terms' are sent to Microsoft's Bing. One solution is to download and install developer Landon Fuller's Python script, which respects users privacy as should have been the default in the first place, even when using Safari's 'Spotlight Suggestions'. <http://www.wired.com/2014/10/how-to-fix-os-x-yosemite-search/?mbid=social_fb>.

[3] *Ad Nauseum* <http://dhowe.github.io/AdNauseam/>.

[4] Ad Block Plus <https://adblockplus.org/>.

[5] Douglas Merrill (ZestFinance CEO) is a former Google CIO who previous worked for the RAND Corporation <http://www.rand.org/>.

[6] According to Datacoup, "The foundation of our pricing model is based on the individual data attributes within each account. When you connect an account, we check for each attribute within the account. If it's available, then we factor that attribute into the final price. Based on initial conversations with many potential data purchasers, we've ranked data attributes as either high, medium or low value. As of writing, spending data attributes have the highest value in our pricing model." <https://datacoup.com/docs#how-it-works>.

[7] The total amount won by participants in the form of auction awards was € 262, which was paid in Amazon vouchers.

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James Charlton

ADD TO SHOPPING BASKET

Our time is perhaps the time of an epidemic of things (Garcia 1).

There are big numbers where the Internet lives. Exabytes of information stored on servers, stacked in data fortresses around the world.[1] Down corridors of container vessels technicians ride on scooters as if in some macro version of computer architecture, repairing and maintaining the physical network of numbers — numbers connected to numbers in networks of servers, ports and cables.

<RDT 310.5

Figure 1: Scooters at Facebook's Prineville data centre (Kellisis).

This is the physical Internet; the bits of the bytes, where numbers exist embodied in physical objects. This is where data has form. It is a spatialized Internet, not simply the temporal spatialization of the cloud but also the physical spatialisation of bodies that literally glide between server modules like the data in the network. It is a place demarcated from other places where information is secured behind datafied biometrics, retinal scans and video footage. It is the body of data. It is where data has dimension, weight, temperature and scale.[2] Where it consumes energy, demands attention and

becomes a thing in itself, and in doing so creates an uncomfortable collision that problematizes the very notion of datafication. It is the ontological tension between data and the world that I want to explore in this paper, because although data has been presented as embodied in the physical architecture of things, this is clearly not the same as a *thing* being data.

<RDT 833.5v

As Viktor Mayer-Schönberger,and Kenneth Cukier point out, 'Big Data' is "data in the wild" — it is as indiscriminate as it is prolific. [3] In fact it is precisely its feral methodological nature that distinguishes it from the pristine, targeted and selective methods of statisticians. Big Data, according to Cukier, is an excess of content gathered without pre-defined intent and represents a shift in emphasis from causation to correlation (Mayer-Schönberger). This temporal remapping parallels the emergence of the 'semantic web'[4] and mirrors the ontological distinction between 'dynamic reasoning' and 'stream reasoning'[5].In this shift from persistent data to transient data (Balduini), we are presented with a new ontological model of data that not only challenges the assumption that the most recent information is the most relevant, but also questions the anthropocentric logic of dynamic data systems in which data sits passively awaiting human attention. Instead data is on the hoof — grazing haphazardly on the uninhabited tundra of the data landscape. Without heed for human cognition such data bears no correlation to the 'thinking' world. The correlational "thesis that we can never think being and thought apart" (Bryant) is buried deep beneath the slag heaps of data that accrue faster than our capacity to interpret them. Regardless of contentious philosophical debates about the veracity of realist arguments such as those

presented by Levi Bryant, nothing seems to refute Kantian correlationism as clearly as the ontological wilfulness of big data. In its rejection of causation and user-centred query methods the flat ontology of Big Data presents a *speculative* turn in which the various flat ontologies of 'Speculative Realism' become relevant to consider.

<RDT 1727.5

It should be acknowledged here that speaking of Speculative Realism as if it were a cohesive philosophical movement is as problematic as assuming all numeric data to be compatible. While all numeric data can be mathematically processed this does not mean it adds up to anything meaningful. Speculative Realism then is better taken as a still emergent and contested stream of continental philosophy that is speculative and feral to the extent that it seems premature to consider it as a movement at all.[6] If Speculative Realism stands for anything it is the "rejection of correlationism *at its most basic*" (Jackson). As the *trending* standard bearer for continental realism, Speculative Realism serves only as useful rallying point for a multitude of disparate voices that "don't even agree about what's wrong with correlationism! […] To be a Speculative Realist all you have to do is reject correlationism for whatever reason you please" (Harman *Bells and Whistles* 5-6). In this sense we can claim that Big Data by virtue of its rejection of anthropocentricism is Speculative Realist in nature.

<RDT 2281

The temporal remapping that Big Data exposes is not just a tension between data and the world but a much more fundamental ontological challenge to the nature of *things*. [7]

As such, Big Data is not simply things as big numbers. Rather it represents a shift in our anthropocentric construct of object-event relationships that challenge discrete causational models of time. My aim is to consider whether the speculative ontological frameworks put forward by Tristan Garcia and Brian Massumi regarding the discrete nature of objects, events and time can serve as a useful platform for understanding the predictive ontology of Big Data.

<RDT 2601.5

Initially the work of Massumi and Garcia might appear an odd pairing to those familiar with Object Oriented Philosophy. Indeed even Massumi seems to distance himself form a primacy of objects when he declares that "neither potential nor activity is object like" (5). While there are clear differences between Massumi's 'Activist Philosophy' and the so-called Speculative Realist *movement*,[8] like Levi Bryant, I consider *object*, *thing* and *process* to be synonyms (Bryant). Despite rejecting Activist Philosophy as a "useless fiction" on the grounds of its *under-mining* of objects, objects are for Graham Harman metaphysical in that they are comprised of a schema of withdrawn *sensual* and *real* qualities. In this 'Quadruple Object Schema' of inner relations (Harman *The Quadruple Object*), there seems to be no basis for excluding *process* or *event* from being objects in Harman's equally *fictional* construct. This is what Bryant is arguing for when he states that, "[N]o object can sit still". Instead the persistence of objects is taken to be an activity of endurance that is central to an object's being (Bryant). In this context Garcia's notions of time and event are taken as complementary to Massumi's Activist Philosophy. At the very least Massumi's work on events should been seen in the light of "their shared opposition to 'subjectivist

philosophy'" (Grusin), and the un-cohesive philosophical *movement* that is Speculative Realism. Rather than rally to the movement-that-isn't, I propose to locate this inquiry on the point of convergence between Harman's object, Massumi's event and Garcia's time in order to understand the ontological challenge presented by the *thing* that Big Data is.

<RDT 3452

Data appears to come from things. Even when data itself becomes its own subject, data requires a source. But are things themselves data? Cukier and Mayer-Schönberg's book available through Amazon is not data — it is a book. That book might have dimension (8.3 x 5.1 x 0.8 inches) and weight (5.6 ounces), it might contain two hundred and fifty-nine pages and nine thousand eight hundred and sixty-six words, but this is not data. These are perceived qualities of the book,[9] and while they might be used to describe it they do not exist as data simply because the book exists.

<RDT 3746.5
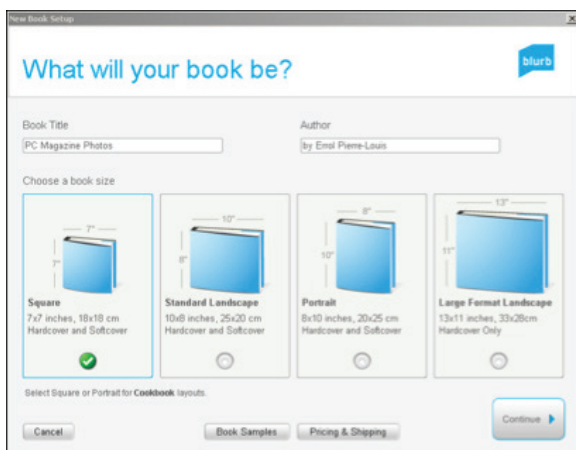
Figure 2: Book dimensions (Blurb (n.d.)).

The thingly channel of being (Garcia, 2014).
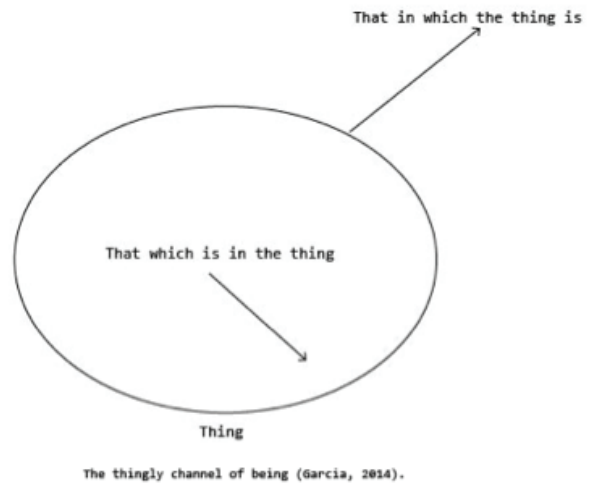
Figure 3: The Thingly Channel of Being (Garcia 2014, 12).

Eventually when that book is purchased, new information is generated. There is now a supplier and a recipient, with associated bank accounts, monetary value, and shipping addresses.[10] But this is not to say the book now has the quality of a street address in the same way that it has a number of pages. The physical book is different from the information associated with the book.[11] The information is its own *thing*. It is data that in one sense belongs to, or came from, the book but in another sense is autonomous. This is the point Garcia makes in distinguishing between "*that which is something*, and *that which something is*"(52). A book is something, but the thing that the book is — its data — is not the same as the book. Conversely, the data is not the same thing as the book. Both exist in their not-being of the other, a process through which they maintain their *compactness* by being in relation to each other.[12]

<RDT 4257

When we '*add to shopping basket*' we create an event that is not an attribute of the book but a subject of the data that *self-creates*. Does this mean data is not a *thing*? No, simply that data becomes a *thing* in the event of becoming itself. It is through this event that data ontologically separates *itself* from the subject of book and person.

<RDT 4435

Massumi clarifies this distinction when, drawing on Whitehead and James he declares that "event itself is a subjective self-creation" (8).[13] Massumi's event is part of a qualitative-relational economy of process between things that is what in relation to Big Data might be called an economy of datafication — the event of self-creation in which data achieves being. This is not the same as saying that data is process — simply an aggregate of *things* that are already in the world. It does not pre-suppose a subject; rather it begins in the event — with data itself (Massumi 6).

<RDT 4729

Interpreting Massumi we might say that the subject of data is the datum in the etymological sense that it is the given and already active in the world. While there is no data separate from event, data is not the same thing as the event either (Massumi 21). Massumi provides a clear and stable diagram of this when he defines an *object* as being a thing in relation to another thing, and an event as the inclusion of a *thing* in relation to another thing. [14] Here, although time affects the relational hierarchies of objects, and it is possible for events to become objects — *things* remain "solitary and in the world" (Garcia 172). This relationship between things and data is further clarified by Massumi's term *semblance* — the manner in which the event potential

appears, "reflecting itself directly and immediately in lived abstraction" (Masumi 19). The *object* thus is declared by both Massumi and Garcia as a paradoxical entity that is "never actual but always in some way in-act" (Massumi 19).

<RDT 5232

Although Garcia's notion of the *thing* initially appears to be consistent with Harman's *thing-in-itself* that is always withdrawn and inaccessible,[15] they reject each other's constructs.[16] While the debate around this distinction remains ongoing,[17] the radical availability of Garcia's *thing* resolves the problem of causality that evades the workaround of Harman's *quadruple-object* schema. It is sufficient to say here that in my opinion both present a consistent ontology in which the *thing/object* is defined by locating self-being in the event of self-creation. It is, however, Garcia's position that provides the most insightful framework for understanding the ontological challenge presented by Big Data that I pursue in this paper.

<RDT 5604

$$N = (N + All)$$

Mapping Garcia's framework to the *add-to* event of the shopping basket we see how any correlational construct of Big Data is set to implode on itself in a feedback loop of infinite recursion — a stack overload of object and event that is the potential of Garcia's *compactness*. *Add to shopping basket* is more correctly *add-to data base* as the information of the sale feeds instantly back into itself as a dynamic pricing system, affecting not only 'personalised' prices and promotions on Amazon but in independent book vendors globally (Ramasastry). As Cukier

points out, Amazon does not care why peo-ple suddenly started buying his book at the end of February, 2014 (Mayer-Schönberger 52); these are simply events generating events within a self-perpetuating system of becoming. Rather than being 'N = all' as Cukier claims (Mayer-Schönberger 26), Big Data constructs the recursive expression 'N = (N + all)' that we see played out in James Whitaker's notion of *domesticated* software — the Super-app that collapses capture and resolve into one event and defers the problem of intentionality and causation to probability (Whitaker).[18]
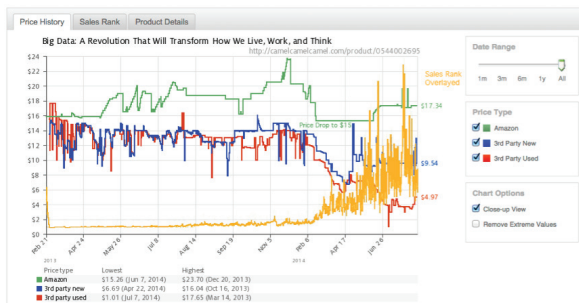
<RDT 6175.5

Figure 4: Pricing fluctuation for Mayer-Schönberger's book *Big Data* compared to number of sales (Green).

Managed by an 'Elastic Load Balancer', this self-generating feedback loop incestuously feeds subjects to themselves in an endless cycle of data-event upon data-event — that we see played out not just in the shopping baskets of Amazon's EC2 and S3 data-bases but at another level in the event of a book's becoming itself — in the event of writing.[19]

<RDT 6405

As if the word count constantly accruing in the footer of every Microsoft Word document were not enough to remind us — every character and every backspace is itself an embedded data-event. In the very simplest of terms every stroke of the keyboard becomes
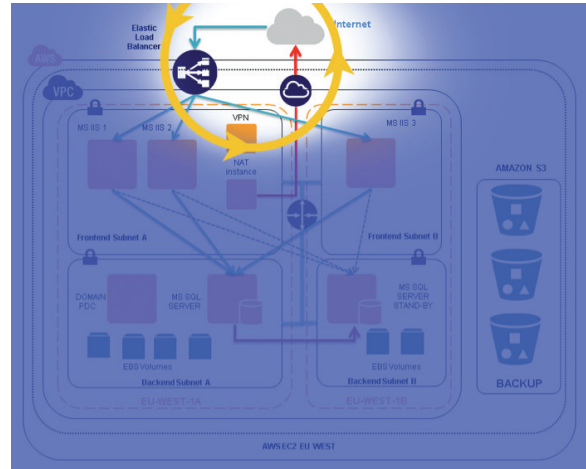
Figure 5: Availability infrastructure in the Amazon AWS cloud (Echeazarra)

a data-event that in the case of academic research is not simply a simultaneous cor-relational act of becoming, but seemingly a priori event of its own becoming.

<RDT 6651.5

For instance, this is played out in the Research Data Tool, a macro for Microsoft Word that calculates the NZ dollar value of the research based on the distribution of gov-ernment research funding to New Zealand Universities according to word count. While thankfully not currently feeding data back to the Tertiary Education Commission (TEC) database,[20] this macro injects the quanti-fied data of the research event back into its own becoming. The calculated value of research is not only seen to be accruing as the document unfolds but is part of the event itself.[21] The practice of writing is positioned in the event of the funding it attracts based on data-content embedded in its own event. Like Massumi's and Garcia's paradoxical *object*, this absurdity is played out as I write in an *object-event* that generates-research-that-generates-data, by generating research about the data it has generated.

<RDT 7108.5

Figure 6: Research Data Tool status bar calculation.

This obviously facetious gesture serves only to point out the distinction between the *event* (practice) of research and the data it generates. To take it otherwise would be to treat it is as if the activity of practice, in this case the typing of words, is the same thing as the data it generates.
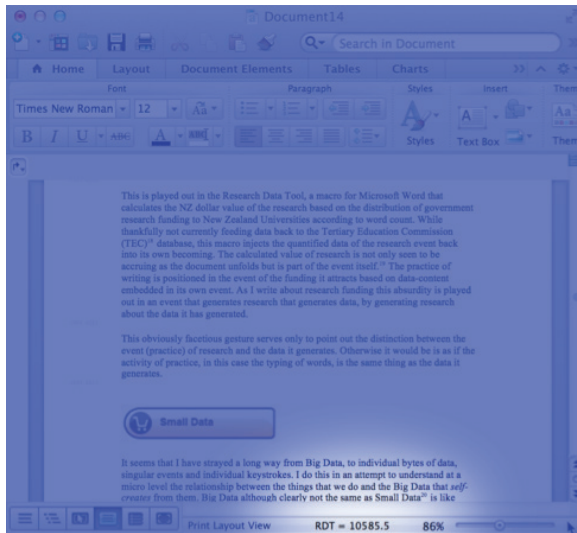
<RDT 7287

It seems that I have strayed a long way from Big Data, to individual bytes of data, singular events and individual keystrokes. I do this in an attempt to understand at a micro level the relationship between the things that we do and the Big Data that *self-creates* from them. Big Data, although clearly not the same as 'Small Data',[22] is like words on a page: an ecosystem of discrete units (Pollock). Despite its scale, Big Data sets are discrete units, things in-themselves that cannot be broken down to anything other than events of their own self-creation.

<RDT 7573

It is this very discreteness, its separateness from the ecosystem of both its event-subjects and content-subjects, which make it a *thing* itself. Discreteness is not scale determinate; a *Dreadnoughtus schrani* is no more or less a thing than a *microraptorine*.[23] In this way Big Data and Small Dataare the same thing. *Things* whose "information is nothing other than a self redoubled by the possibility of reproducing and transmitting its possibility" (Garcia 202). Both are irreducible to the event of self-becoming. Both are *things*.

<RDT 7843.5

The emergence of an event is the "irreducablity of a material level of organisation to a microlevel" (Garcia 193). Thus while Big Data can never be reduced to an individual *add to shopping basket* event, at a material level these events become discrete Big Data entities — if you like, *checkout* events.

<RDT 8001.5

Discreteness then is the state of being that any *thing* is, including the *thing* that is an event. The condition of being a thing is that it is somehow discrete; that it is a self- contained packet of information not unlike *the digital* — a discrete mode of representation (Lewis).[24] However, this is not a model of *things* as isolated and withdrawn entities but rather a model of *things* that, as Garcia would have us believe, are always in the world: *things* that are discrete in themselves yet continuous in other *things*. This finally makes sense of Garcia's compounding statement that a "thing is nothing other than the difference between *that which is in this thing* and *that in which this thing is*"(13); the difference between the digital and the analogue that coexist in the necessity of being a *thing*.

<RDT 8410.5

Mayer-Schönberger is correct in saying that datafication is not digitization only if he means datafication is not a process of reducing the continuous to the discrete (78). However his specific references to datafication as an activity that turns all aspects of life into data, is ontologically limited (78-83). *Things* do not become other *things*. Data comes into being in the event of its relation to other *things*, things it remains separate from. In the sense that data is discrete and its own *thing*, it is also continuous in its relation to its subject.

<RDT 8695.5

The differential pairing of event and subject creates what Jeff Jonas calls 'Enterprise Amnesia' — the forgetting of what is known — that exists in the space between observation and sense-making. Using puzzle-solving methods, Jonas' argument for a 'New Physics of Big Data' is centred on context as key to sense-making and points out the temporal dilemma of Big Data.

<RDT 8887

The emphasis Big Data places on correlation over causation — on "*what* rather than *why*" (Mayer-Schönberger, as cited in McMillian) — is shown by Jonas to be a problem of the separation of information from context – of isolating Big Data from its subject. Interpreting this within a Speculative Realist model as presented by Garcia, we understand how inseparable the subject of an event is from its data. Like pieces in Jonas' puzzle, both subject and data only make sense when they exist in the context of the event.

<RDT 9151

The predictive potential of Big Data lies in its temporal amnesia. In its willingness to embrace "real-word messiness rather than privilege exactitude" (Mayer-Schönberger 19), Big Data deliberately seeks to ignore context and focuses instead on prescribing future events based on dirty data correlations. Rather than time disambiguating the relation between subject and data as proposed by Jonas, it is the event-in-time that necessarily distinguishes between the thing and the thing that it is not — the data.

<RDT 9412.5

Intent on the future, Big Data's predictive gaze is grounded on a construct of time that is reliant on the separateness of present and future.[25] In not caring why something happened, Big Data isolates itself from the causal past and locates itself fully in the self-realising events of the predictive future.[26] It becomes a *thing in itself* that is reliant on a discrete quantified construction of time that allows for the notion of prediction. Mayer-Schönberger's insistence that "predictions based on correlations lie at the heart of Big Data" is an invocation of an understanding of time from the present. Only when we locate ourselves exclusively in the present can the potential of prediction be realised. Only when a *thing* exists out of context (Jonas' Enterprise Amnesia) and is a *thing* only in itself (Garcia's *compactness*) can Big Data's predictive claim be made.

<RDT 9854

How then do we resolve this apparent incompatibility between Big Data's correlational construct and Garcia's *thingness*? It seems we must either revise Garcia's argument for *compactness* (rejected by Harman in *Object-Oriented France: The Philosophy of Tristan Garcia*) or disregard the predictive value of Big Data.[27] Drawing on McTaggart's series construct of time which holds that the "distinctions of present, past and future cannot be true" (464),[28] Garcia offers us a third option of resolving the co-conditional construct of *things* as *things*-in-something, when he proposes a continuous model of time in which past and future are *intense variations* of presence rather than isolated positions. [29] The future, rather than being discrete and separate from the present, is part of the continuity of event time in which the discrete *thing* is something (Garcia 177-187). Garcia's model removes the tension between object and event by providing a structure in which discreteness of Big Data and the continuity of practice cannot be separated.[30]

<RDT 10377.5

Rather than consider the data of Mayer-Schönberger's book as separate from the book object, we should understand that the book and its data exist as an embedded mutual exclusivity. In the same way we must understand that data, rather than existing in isolation, is inherently related to other things/objects — objects both past, present and future.

<RDT 10559.5

I started this paper wandering the corridors of Google's data centre and thinking about how to separate data from objects, only to find myself standing back at the security desk again. Every item I have added to my basket along the way is simply another event in the event that is the continuity of relationships between things in the world.

<RDT 10738.5

Big Data however doesn't change the intrinsic nature of *things*. Data can only be ontologically isolated as separate and discrete in itself if we accept time as a construct of the present. However this sequential model conflicts with the Mayer-Schönberger predictive function of Big Data which seeks to distance itself from its subject while simultaneously collapsing object and event into a correlative present. Big Data should not be so easily allowed to exempt itself from the world by escaping into the predictive future in this way. Alternatively we can understand how Big Data might maintain its predictive function without ontological implosion by using Garica's time of *intensity* and Massumi's *event of self-creation*, and accepting that *objects* must be understood as being both ontologically analogue (continuous) and digital (discrete) within the intensity of time. In this way things not added to the shopping basket can still proceed-to-checkout on their own.

<RDT 11231

Notes

[1] The world's largest data centre — Lakeside Technology Center in Chicago, reportedly covers 1.1 million square feet of the Gothic Industrial Age icon. Built to print the Sears Catalog in 1912 it has always functioned as a data base site. <http://www.datacenterknowledge.com/archives/2009/01/06/chicagos-data-fortress-for-the-digital-economy/>

[2] Data is fundamentally embedded in measuring and recording the world. (Mayer-Schönberger 79).

[3] Although I struggle with the *popademic* styles of Cukier and Mayer-Schönberger's writing, its points are generally useful to this debate.

[4] "The Semantic Web is an extension of the World Wide Web, where the semantics of information is encoded in a set of RDF statements" (Margara). RDF is a standard model for data interchange on the Web.

[5] Definitions for these terms are taken from Balduini's presentation to the International Semantic Web Conference in 2013. Dynamic data is persistent, stored and queried on demand. Stream reasoning takes data as transient and continuous – to be consumed on the fly (Balduini).

[6] Used here in favour of 'Object-Oriented Philosophy', or 'Object Oriented Ontology' due to its more inclusive stance in regards to Continental Realism and Materialism.

[7] The italicized term *thing* here is used specifically in the double sense Garcia defines in *Form and Object*. Garcia defines a thing as "nothing other than the difference between *that which is in this thing* and *that in which this thing is*" (13). This distinguishes it from both Heidegger's and Harman's thing.

[8] Not least being the "*aesthetico-political*" and "*speculative-pragmatic*" (Massumi 12). Byrant also provides a succinct comparison of the difference between Massumi and Harman in his blog post *The Dynamic Life of Objects* (2012).

[9] Interpreting Garcia we could consider this in relation to the quality of a *thing* and the *thing* that constitutes an object (171). See also: *Fig.1: The substantial channel of being* (Garcia 9). Alternatively following Graham Harman we would specify these to be *sensual qualities* (Harman, *The Quadruple Object*).

[10] I could add here associated profiles, with associated histories etc., but this would simply widen the event of the purchase out infinitely in a way that might conform to Timothy Morton's 'Hyper Object' (Morton). Despite differences in the way Speculative Realists articulate *things*, all *things* maintain their difference from things they are not. *Things* are always in relation to each other (even if only partly so). *Things* are always something they are not even, if they are in something else. This is why data is not the same as its subject. Another way of saying this would be that a *thing* is not reducible to data. Data becomes its own thing.

[11] Information that is perhaps associated more to another thing such as house's street address.

[12] In unpacking the ontology of things, Garcia proposes that failure is in fact a condition of the compactness of an object being itself (64).

[13] Massumi's activist philosophy draws heavily on Whitehead's process philosophy and James' radical empiricism.

[14] I am referring directly back to the opening argument in which *object*, *thing* and *process* are taken to be synonyms (Bryant 2012). As Speculative Realism in general treats both physical and metaphysical *things* as objects, one can reasonably consider an idea to be an object.

[15] Drawing directly on Heidegger's *dasein* and Kant's *noumenon* (Harman, *Bells and Whistles: More Speculative Realism* 75).

[16] See Graham Harman's *Tristan Garcia and the Thing-in-itself.*

[17] Harman is not convinced by Garcia's "argument that the *in-itself* is an impossible nonsense that Garcia calls its *compactness*" (Harman, *Tristan Garcia and the Thing-in-itself* 34), the possibility of the failure of its own conditions of possibilities (Garcia 64). The difference in part fuelled by different terminology — Harman's object is Garcia's *thing*. It is I believe simply a matter of understanding how Harman's *Quadruple Object* schema allows a thing to be both in-itself and beyond-itself at the same time.

[18] To quote: "Capture it where it occurs and we want to resolve it where it occurs, no more hunting and gathering, we're going to domesticate this information, we're going to domesticate this functionality" (Whitaker).

[19] Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances in the cloud. EC2 and S3 are core features of Amazon Web Services remote computing system (AWS).

[20] TEC is responsible for implementing Performance-Based research fund (PBRF) a funding mechanism that aims to "ensure that excellence research in the tertiary education sector is encouraged and rewarded. This entails assessing the research performance of TEOs and then funding them on the basis of their performance." (Tertiary Education Commission)

[21] The Research Data Tool value inserted is recursively counted as part of the RDT value. See indent values <RDT 4862.5.

[22] "What is different is the *Volume*, *Variety* and *Velocity* of big data…" (Gutierrez).

[23] A *Dreadnoughtus schrani*, from Upper Cretaceous sediments in southern Patagonia, Argentina estimated as being about the same size as a dozen African Elephants (Lacovara). *Changyuraptor yangi* is a recently discovered microraptorine, a group related to early avians and raptors and is estimated as being about the same size as a turkey (Choi).

[24] The term 'digital' is used here as an extension of Lewis' widely accepted definition of *the digital* as being a discrete representation in opposition to the analogue, which is seen as a continuous representation.

[25] For clarity I have omitted past that is the separated domain of causation.

[26] As illustrated by the Research Data Tool.

[27] Something that would go against the mandate of an ever-accelerating, technological imperative.

[28] McTaggart support Garcia in that he present a Hegelian time-series theory in

which "time is in time" (McTaggart 469).

[29] It is useful here to remember Henri Bergson's treatment of duration and memory: "Questions relating to subject and object, to their distinction and their union, should be put in terms of time rather than of space".

[30] His model is based in part on 'Growing Block-Universe Theory'.

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Audrey Samson

ERASURE, AN ATTEMPT TO SURPASS DATAFICATION

Selfies, email archives, twitter posts, likes, places, late night chat logs, health insurance records, bank transfers, search histories… all those bits of identity, involuntarily immortalised as personality profiles in corporate server farms. Could erasure offer some respite from endless datafication? This "undead media" (Chun 134) not only facilitates the surveillance apparatus, the persistence of data also affects how we remember. Digital death (post-mortem digital data ownership concerns) exemplifies how the structure and inner workings of network technologies and software platforms affect our experience in a tangible way. The following research is concerned with what kind of role the materiality of Internet technologies plays in post-mortem digital legacy, and how it bleeds into our mourning practices. It explores these questions by examining how Facebook and Google deal with digital death, and what kind of consequences the materiality of the network entails. The notions of materiality are understood here as a space of interaction between code and hardware (Hayles) and perceived materialization of phenomena iteratively configured by dynamics of "intra-actions" (Barad 140). In the examples considered I look at how terms of agreement apply to memory in the form of externalised tertiary retention in the process of "grammatization" (Stiegler 3). The research also looks at the biological human memory's materiality and its need to forget (Kirschenbaum). I discuss the *ne.me.quittes.pas* project as a means to propose digital data funerals as an artistic strategy to make data tangible and to explore how these layers of stockpiled data constantly re-configure our identities. I argue that digital data funerals offer a symbolic ritualised gesture that draws attention to the materiality of data through tangible and physical degradation, in an attempt to surpass post-mortem datafication, and surveillance.

Digital death is a growing concern as personal data and archives are increasingly digitised and stored in networked servers. It refers to the issues surrounding data ownership after a person's death. In recent years numerous start ups are addressing the issue as well as corporations like Facebook, Google and Twitter. Social networking sites like Facebook and Twitter have a rising number of deceased users.[1] These companies have consequently developed policies for what happens after their constituents die.[2] Facebook has a profile memorialisation option while Twitter will discontinue the account. *Ik R.I.P.* was a platform developed in 2009 as a reflection upon this then *new problem*.[3] It enabled users of the Mediamatic site to draft a digital will of their Mediamatic profile. More recently, companies like the Hong Kong based Perpetu, are concerned with handling your digital legacy after you die, a sort of digital executor of your social networking life.[4] LIVESON is a platform that proposes to continue your Twitter presence after you die based on your previous behaviour (with AI).[5] Eterni.me goes a step further and anticipates to collect "almost everything that you create during your lifetime",[6] to then generate an avatar that emulates the deceased and acts as an interface for loved ones to gain access to this database of a lifetime. A host of companies offer services to safeguard passwords to digital data and distribute them to the appointed person after death (Legacy Locker, Entrustnet, Digizeker). Some services include the passing on of messages to pre-assigned individuals upon death (Deathswitch). There are also a plethora of memorial platforms (Life.Vu, Forever Missed.com, Legacy.com, Tributes. com, Remembered.com, iLasting.com, Last Memories.com). Mostly, efforts are being made to think of ways to keep access to data alive after a person dies, in some cases even a simulation of the deceased.

There is very little said however about the erasure of digital data. Viktor Mayer-Schönberger addresses the issues of data privacy that arise with digital archiving in *Delete: The Virtue of Forgetting in the Digital Age*. The lack of context inherent to digital information for example can come back to haunt people later. They may lose a job over an unsavory picture posted 10 years earlier, or be denied access to a country. Many of the initiatives that are thinking about digital death are concerned with data privacy issues, the political and social implications of lingering data.[7] Who should have rights over a person's data after they die, for example? There is another aspect to digital death that Mayer-Schönberger points to, that forgetting is paramount. It is a built-in function of the brain, not a defect, that enables it to function properly. It would appear that a recent study at the University of Basel shows that the brain actively erases information and that mental illness could arise should that process be disrupted (Hadziselimovic et al.). Though we might perceive our memory as failing, it would seem that selective retention is how it is meant to work. The question then becomes, with the advent of digital technology, and cheap, plentiful storage devices, how is this nearly limitless archiving affecting our need to forget?

Wendy Chun tells us that "computers have conflated memory with storage" (134). She explains that the way of putting information into computer storage (called random access memory) has replaced storing memories. The materiality of storage devices such as hard disks enables forensic retrieval of data even after it has been erased. As such, it is enduring. However the contextual information surrounding the data is lost, the experience of using it is ephemeral. Therefore data is "undead" (Chun 135), somewhere in limbo between life and death, present and absent. Furthermore, software promises eternity

through constant reading or regeneration. Software is constantly executing: read-write. Though the idea of its permanence is paradoxical because of rapid deprecation, the illusion is sustained. Perhaps this is partially why online mourning is so widespread, digital data's promise of preservation appeals to the desire to sublimate death.

Archived data is a form of legacy. That said, as Jacques Derrida reminds us in *Archive Fever*, the archive is also the seat of power.[8] Bernard Stiegler believes that retention is determined by the technical. Using Husserl's notion of temporality, he posits that tertiary retention has been externalised through what he calls "grammatization" (Stiegler 3). Contemporary forms of grammatization are *writing* to digital and numeric media. In this respect, online mourning is not only alluring by its promise of *forever* but it is also bound by the post-mortem conditions of datafication. That is to say that our externalised retention, stored in the databases of Facebook, Google, and Twitter, for example, are bound by the terms and conditions of these platforms. Digital death made issues related to data ownership and surveillance clear long before Edward Snowden. In the early days of MySpace and Yahoo Mail, loved ones wanting to claim or access the deceased's profile or email account were confronted by the lack of rights to do so.[9] Once data is uploaded to the network, control and ownership is relinquished (unless you upload to your own server and you have access to its physical location, but arguably even then). The recent actress nude photo phone hack scandal (through iCloud) shows how easily digital data can be accessed in the cloud without the owner's knowledge.[10]

To illustrate post-mortem conditions of datafication I consider Facebook and Google as examples. In the case of Facebook two options are possible when a person dies: memorialisation or deletion. The person

wishing to act upon the dead person's profile must show Facebook a death certificate. A memorialised page can no longer be modified and should no longer appear in suggestions such as *People You May Know* or birthday reminders.[11] Depending upon the privacy settings set upon memorialisation, posts may be made by friends on the Timeline. Interestingly, anyone can send private messages to the deceased person, however Facebook does not allow anyone to log into a memorialised account to read those messages. Where are these private messages going?

The other option is to request to have the profile deleted. Though it is not specifically offered in the case of death, a 3rd party may request an account deletion if the condition of the profile owner is irreversible. This service is normally offered if a "friend or family member (that) is mentally or physically unable to maintain their Facebook account". [12] Facebook reviews the request depending on the situation and decides whether it will grant the request or not. That said, it is important to note that the deletion is largely symbolic because it is impossible to erase all data for a range of reasons. Facebook does not completely erase a person's traces. They state that the most personally identifiable information associated with the account, like email addresses, are removed from the database, while some personally identifiable information may remain, such as the account holder's name if a message was sent to someone else. The materiality of the network also determines the persistence of the data. Facebook states that: "copies of some material (ex: photos, notes) may remain in our servers for technical reasons".[13] These technical reasons are based on the nature of the network and the social networking platform. Traces remain in the servers. In other words, as soon as a digital object (for example an image) has been linked to or shared,

those instances are eternal, in the words of Chun, through their constant propagation. Both cases offer different conditions of datafication and affect the mourning experience differently. However in both cases the data *lives on*.

Google catalogues and archives many aspects of our existence: in Gmail, Drive, Calendar, Search History, Google+, Wallet, Talk, Location History, for instance. The Search History, like other Google services, can theoretically be deleted after a determined period of inactivity if the account owner signed up for the Inactive Account Manager service, Google's answer to digital death. This Google service offers the option to notify contacts and share data, specify the length of time that determines whether the account is inactive (i.e. 12 months), and the option to delete the account. Noticeably, the data can be shared with contacts, but not handed over. If the delete option is chosen, there are nonetheless some bits that can not be deleted, such as server logs.[14] When a webpage is visited, the request sent from the user's browser to the server is automatically recorded. The request contains such information as the user's Internet Protocol address (IP), the date and time of query, the words that were entered in the search query box, and a unique cookie ID. The cookie can be erased but every time a specific device is used, a cookie is reassigned. Also, the IP shows the geographic location where the query was made from. Therefore the server logs can show a relatively comprehensible image of a user's search history. Google specifically states that it "may store searches in a separate logs system to prevent spam and abuse and to improve (our) services."[15] While it is true that system administrators use server logs to detect issues with the network it is unclear how long these records are saved. Furthermore, though Google uses anonymous identifiers, the effectivity of the

anonymization is contestable. Recently, certain online surveys have shown how easy it is to identify a person by asking a few simple questions.[16] The question of anonymity is a valid one.

The data and its traces that remain regarding the Search History after a person's death are therefore subjected to whether the person signed up for the Inactive Account Manager and what options were chosen. If the account was not linked to this service the data continues to exist in the databases. Even if the account was linked, and the delete account option was chosen, the server logs that are kept can reflect a person's search history and consequently their behaviour and interests. Arguably, we are being studied and marketed even after death — a sort of necro-financialisation of data.[17] As in the case of Facebook, total deletion is not possible, both because of Google's terms and conditions as well as the materiality of the network, which is such that data propagates itself in a quasi non-reversible fashion. Therefore *our data* (emphasised because it is no longer *ours*), is not only stored in server farms long after we die but it is bound to precise terms upon which we have no influence or agency. This determines not only the surveillance possibilities that have been subject of so much recent concern but it also frames the mourning process whether in the form of memorialisation and inactivity managers, or in the form of undead media.

As Matthew Kirschembaum shows us in *Mechanisms: New Media and the Forensic Imagination*, the forensic materiality of data has an influence on how the data is *read* and therefore experienced. He gives the example of the game *Mystery House* stored on a floppy disk using a disk image viewing utility. He explicates how the data is physically parted and stored in magnetic tracks on the floppy has bearing on the textuality of the story. Not only is the physical geometry of Mystery_House.dsk vulnerable to volumetric storage logic but Kirschenbaum also suggests that "a floppy disk image can also reveal the hand of the reader or user" (127). His model of critical practice cultivates a thick textuality that takes into account the specificities of the individual storage device, much like the forensic analysis of a crime scene. Kirschenbaum's approach reminds us of the tangible aspect of digital data. Though data might be thought of as immaterial when metaphors such as *the ether* and *the cloud* are so widely used, the affordances of data materiality impact conditions of datafication. As big data sets are constantly amassed, the materiality of data and the question of its erasure is no longer an issue solely related to digital death and mourning but also to privacy, data ownership, surveillance, cyberbullying, and so on. The right to erase and/or forget, recently brought up in an EU court ruling against Google,[18] shows how this reality is emerging, and the consequences of data materiality. The court's decision can be seen as a political gesture that attempts to surpass quantification.

Heidegger warns us of the danger of not considering what he calls the essence of technology, a mode of (human) existence as *enframed* by technology. Woman herself becomes "standing-reserve" (Heidegger 8), a mode in which everything is considered through calculation and orderable as a system of information. Quantification resulting from big data analysis could be equated with Heidegger's notion of the standing-reserve, in which (wo)man becomes themselves datafied. As this happens, it appears as if technology's enframing is destiny, linking to Luciana Parisi's notion of big data's preemption of situations (creating its predicted future). The threat becomes "pushing forward nothing but what is revealed in ordering" (Heidegger 13), and therefore deriving all standards on the basis of quantification, a

perilous self-fulfiling profecy. How might we escape the quantification loop? Perhaps we might look to Heidegger again, in his view that art (*techné*) has the paramount role (and capacity) to reflect upon the essence of technology, and insodoing, to surpass the coming-to-pass of truth through technology. We cannot erase our social media traces nor escape necro-financialisation, though conceivably, an artistic gesture of erasure that points to the crisis of datafication might engender critical reflection outside of this self-fulfilling prophecy cycle.

ne.me.quittes.pas is an art project that proposes such a gesture in the form of a digital data funeral.[19] It begins to adress a relatively underconsidered and important part of digital archiving ubiquity: the erasure of digital data. The starting point of the project is a public installation that offers USB keys and a set of instructions in a pre-addressed envelope (see fig. 1). The keys can be picked up by anyone who wishes to participate. The instructions read:

> *1. Take a USB key home with you.*
> *2. Think about what data you would like to ritually erase.*
> *3. Transfer the data to the USB key (delete original).*
> *4. Send the USB key in the pre-addressed envelope and remember to include your return address.*
> *5. You will receive your data remains in the post.*

In practice many people simply take the object home, and keep it, which is a small irony that might point to the difficulty of parting with data. The audience that engages with the piece sends their data in the post, following the literal metaphor of sending packets over the internet. The envelopes are addressed to the City University of Hong Kong, where they are then taken to the biochemistry lab to

Figure 1: *ne.me.quittes.pas* **installation.**

perform the digital data funeral. The keys are immersed in a mix of concentrated hydrochloric (>37%) and nitric acid (>65%) (called Aqua Regia, used to dissolve noble metals). The liquid is extremely corrosive and will dissolve all metal on the USB key through a process called *digestion*. The procedure lasts around 90 minutes, during which time the acid slowly turns from translucent yellow to opaque brown as all metal corrodes in the liquid, also causing spatters. The process is visceral, the fragility of the USB key and its data are exposed in the bubbling liquid. Once the digestion is complete, the liquid must be diluted many times over to reach a neutral PH (to be able to empty it in the sink without dissolving the metal pipes). After dilution, the results consist of the printed circuit board (PCB) devoid of components, a few non metalic components like resistors and capacitors, the plastic part of the USB connector, and two chips, the chip that housed the memory and the chip that controlled the USB. The chip pins have melted away, it is therefore difficult to imagine retrieving their data (though arguably possible), and it is very likely that acid entered through the pin holes and irremediably corrupted the data. The memory chip still conserves the text *ne.me. quittes.pas* that was silkscreened onto it at the manufacture in Shenzhen (see fig. 2).

These remains are then soaked in water for several hours to rinse any remains of acid. They are then placed on a piece of
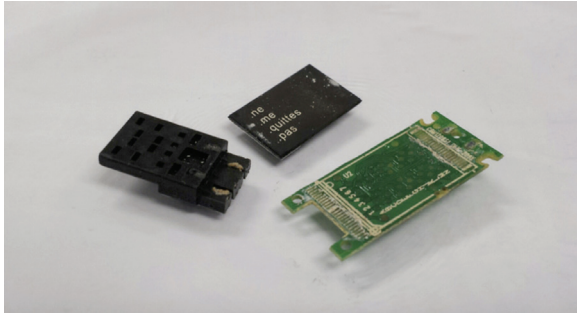
Figure 2: *ne.me.quittes.pas* **digital data funeral remains (after corrosion in Acqua Regia).**

Figure 3: Digital data remains shown as they are packaged to be sent back to the participant.

velvet foam pressed into a small transparent jewellery box and sent back to the owner by post (see fig. 3). The envelope itself is designed with the specifications of the Hong Kong post in mind for machine reading. It is the smallest size that can be machine sorted and adheres to specific requirements of font, font-style, color, weight and thickness. The design emphasises the relationship between the content, the vessel and the communication system. The envelope also bears a text in three languages, a translation of the chorus from the famous song *Ne Me Quitte Pas* by Jacques Brel:

> *Ne me quitte pas* (Don't leave me)
> *Il faut oublier* (We must forget)
> *Tout peut s'oublier* (All can be forgotten)

This is a melodramatic love song in which Brel begs and pleeds with a woman not to leave him. There are various documented versions of concerts in which he is crying profusely while singing. In French speaking countries, this song is a well known ode to love lost and the pain of letting go. The lyrics simulataneously ask the woman to forget all the difficulties in the relationship, but not to forget or leave the man. It reflects the tenous relationship we have with memory. One the one hand we don't want to forget, but we would like to forget certain things, and as mentioned before, it is even necessary for
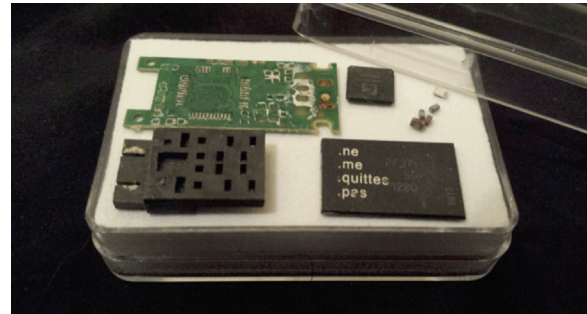
the brain to forget in order to function well. In *Journal de Deuil*, Roland Barthes, talks about mourning the loss of his mother. He documents his consternation at the loss of her memory, her face and her voice, slowly blurring in his mind as time passes. Simultaneously, he bemoans the crippling nostalgia, as forgetting is an essential part of mourning. The envelope was therefore designed with this tension in mind, the desire to remember and the necessity to forget.

Interestingly, recent cognitive neuroscience has shown that memory is perhaps not a one off inscribing process (called *consolidation*), in fact even recalling a memory will change its nature (and therefore content). Synapses, responsible for neurotransmission between neurons, are highly mutable. Synaptic networks grow based on the chemical exchange that forms and recalls memories. For example, memories associated with fear, when reactivated, are easily altered to a state that requires a protein synthesis to reconsolidate it (Nader et al.). It would seem that when a memory is reactivated through retrieval it becomes labile, and thus changes. This process of read/write which memory undergoes could place memory at the site of execution, rather than storage, in computer science terms. When bits are re-written (read/write) electrical pulses are sent which modify the 0 to 1 or 1 to 0. The execution could also be understood as transmission, or more precisely that the site of execution

is the transmission itself. Human memory is formed in the transmission of chemicals between neurons that never touch each other. The chemically induced mutation occuring at the synapse, itself a 'space in-between', is the locus of genesis, where new and modified memories are born. Thus transmission is becoming.

If time can be/is effectively effaced (and politics) through systematic re-writing of *history*, where does this leave us? The site of execution becomes politicised. When this occurs within the terms of agreement of Facebook or Google for example we are without recourse and our memory is labile under the corporate scalpel. The archive fever is growing strong, between grammatization in corporate servers, systematic surveillance and data persistence; the materiality of data is trapping us by eluding us, as Heidegger warns. By looking at how Facebook and Google deal with digital death, the materiality of the network and some of its consequences come to the fore. The undead data, phenomenon created by the platform code (software) and network infrastructure, haunts us and our need to forget. Mayer-Schönberger reminds us of the social implications of these digital archives. In light of the developments in cognitive neuro-science we might consider erasure as an important part of archiving, and think of memory as a dynamic process of constant execution, *happening* in transmission. The word execution itself stems from *exécuteur* (12th century French), the person that is responsible for carrying out the will. *ne.me.quittes.pas*, a digital data undertaker service of sorts, is a gesture that plays with this site of execution. Through the visceral procedure of physically degrading data, the 'undead media' is symbolically exorcised. The project is purposefully naïve in its apprehension of digital data, yet it opens up questions pertaining to the crisis of datafication, through a mourning ritual. Mourning is the most visceral of human emotions, it deeply confronts the mourner with the materiality of human life.

Bring us your data, we will put it to rest.

Notes

[1] By the end of 2012 Entrustnet calculated that number to be 3 million on Facebook. See http://www.huffingtonpost. com/2012/12/07/death-facebook-dead-profiles_n_2245397.html. See XKCD for a projection of future numbers: https://what-if. xkcd.com/69/.

[2] See Twitter's policy adopted in 2010: http://www.thedigitalbeyond.com/2010/08/ twitter-adopts-policy-for-deceased-users/, and Facebook: http://www.thedigitalbeyond. com/2012/02/what-happens-to-your-facebook-account-when-you-die/.

[3] Ik R.I.P.: http://www.mediamatic. net/73602/en/www-ikrip-nl.

[4] Perpetu: https://perpetu.co/.

[5] LIVESON: http://liveson.org/connect.php.

[6] See http://eterni.me/.

[7] See The Digital Beyond blog (http://www. thedigitalbeyond.com/), Passare (http:// www.passare.com/how-manage-your-digital-assets-0), Digital Death (http://www. digitaldeath.eu/), My Digital FootPrint (http:// www.mydigitalfootprint.com/), Digital Dust blog (http://digital-era-death-eng.blogspot. co.il/), for digital data issues or, *Your Digital Afterlife: When Facebook, Flickr and Twitter Are Your Estate, What's Your Legacy?* (New Riders Press, 2011) by Evan Carroll.

[8] In *De la grammatologie*, Derrida writes about *sous rature*, a way to simultane-ously erase and leave a trace that points to the erasure. Interestingly, in Gayatri Chakravorty Spivak's introduction to the English translation, she attributes the difference from Heidegger's use of the term to "an inarticulable presence" which is "the mark of the absence of a presence, an always already absent present" (Derrida, 1967: xvii).

[9] See an example news report from 2006: http://news.cnet.com/Taking+passwords+to +the+grave/2100-1025_3-6118314.html

[10] See http://www.news.com.au/entertain-ment/celebrity-life/jennifer-lawrence-nude-photos-leaked-hacker-posts-explicit-pics/ story-fn907478-1227043406704

[11] See Facebook memorialisation and deletion conditions: https://www.facebook. com/help/359046244166395/

[12] See https://www.facebook.com/ help/480409628639043

[13] See https://www.facebook.com/ help/125338004213029

[14] See server log terms: http:// www.google.com/policies/privacy/ key-terms/#toc-terms-server-logs

[15] https://support.google.com/websearch/ answer/465?hl=en

[16] See the NYT report on the dialect quiz: http://www.nytimes.com/interac-tive/2013/12/20/sunday-review/dialect-quiz-map.html?_r=1& and the original blog post detailing the issues, https://brooksreview. net/2014/01/i-see-you/.

[17] See article: http://www.dailytech.com/
Prof+Calls+Out+Facebook+et+al+For+Ho
arding+Dead+Peoples+Digital+Remains/
article27798.htm.

[18] See article in *Spiegel Online*: http://
www.spiegel.de/international/business/
court-imposes-right-to-be-forgotten-on-
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[19] See *ne.me.quittes.pas* website: http://
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Minka Stoyanova

GAMING SYSTEMS: CREATIVE CRITIQUES OF THE LUDIC REAL

A headline on the popular blogging site, medium.com, reads: "Cruel Intentions: How I hacked Tinder and got 2015 matches in under 17 hours (the formula to become wanted on Tinder)." Miranda July has released an app and associated video — funded by fashion brand, MiuMiu — that allows users to select physical proxies to deliver (text-)messages. These playful actions are only two examples of how creative individuals are critiquing the process by which the ubiquitous adoption of mobile computing devices has implicated all of us in a techno-social system of interaction dominated by the codified and computational logic of the game. These 'creatives' reveal inherent dissonances in the computational structures we have accepted by extending the game logic to its (often) absurdist conclusions, thus allowing us to achieve an essential critical distance and inviting us to question the validity of those structures.

The following essay will first examine the modes by which these computational structures, in the guise of games, have come to dominate our understanding of, and interaction with, the non-game world. It will then identify how the application of this logic creates cognitive and phenomenological ruptures, which can be leveraged by creative individuals to reveal logical fallacies within the applied structures. Throughout, it will identify and analyze creative practices that exemplify responses to these logical fallacies in order to identify ways in which a new class of creative individuals is emerging to tackle the dangerous slippage between gamespace (the space of play, games) and game-ic (gamic) space (ordinary/real life to which ludic properties have been applied).

Gamification: from Mary Poppins to slippery signifiers

Play theorists Johann Huizinga and Roger Caillois both situate play outside of the real or the ordinary. Play, for Huizinga, occurs within "certain fixed limits of time and place", within what he terms, the "magic circle" (Huizinga 28; Caillois 9-10). However, as the logic of the game and the attitude of play (the ludic) permeate our daily lives, this boundary becomes increasingly permeable. The process of 'gamification' — the application of game-like structures to non-game activity — is one mode by which the logic of games encroaches upon our experience of both the playful and the serious, and by which the two are becoming increasingly indistinguishable. The first, and most obvious example of gamification is the application of rewards or competition to labour activities in order to incentivize production. The "whistle-while-you-work" or 'Mary Poppins approach [1] to personal motivation is a well-known and historical model of personal behavior modification, so it is not surprising that it has its analogue in the modern digital age. Gamified quantified-self applications such as fitness and dietary trackers, work tracking applications such as pomodoro timers, Written Kitten or Write or Die exemplify this approach to personal behaviour modification and point to its growing popularity.

However, it is not simply the application of incentive-based logic that is driving the gamic turn in digital technologies. Mobile computational systems which are becoming increasingly coterminous with our physical bodies, through the application of hegemonic interaction design standards are making it increasingly difficult to differentiate the 'magic circle' of play (Huizinga) from the fully

serious realm of work or 'ordinary life'. For instance, augmented reality systems (such as Google Glass) introduce a mode of interaction that once iconically typified gamespace, the heads-up-display (HUD).[2] In video games the HUD feels "uncomfortable in its 2-dimensionality" (Galloway 35). Its inability to visually penetrate the core of the rendered game world – the fact that the HUD creates a screen through which the game world is viewed and which sits permanently on top of, and thus external to, the rendered game world — acts as a constant visual reminder of our presence in a space which is outside of the real or the ordinary; 'a magic circle'. However, if augmented reality technologies like Google Glass continue to increase in popularity, what once signified the fiction of our experience might become a dominant mode of interaction with the real, thus drawing the experience of the real closer to that of the game. Conversely, improved virtual reality technology like the Oculus Rift promises an increasingly real-like experience of game-play through its fully immersive interface, bringing the experience of the game closer to that of the real.

In *Critical Technology*, Graeme Kirkpatrick outlines three ways by which games have driven the overall trajectory of technological development (83). The first of these influences has arisen through the introduction, normalization and subsequent proliferation of hegemonic human-computer interaction design standards, visual shorthands such as the aforementioned HUD. Secondly, in order to allow for the implementation of these globally adopted design tropes as well as in order to continuously increase the spectacularity of games, game systems have driven technological advancements such as increased computational power. Finally, games have driven a conception of technology as a source of "friendly, exciting and 'fun' illusions" (83-84). In this final aspect,

Kirkpatrick notes that "games train people for life in a society dominated by computer technology" (84).[3]

However, as the phenomenological experience of game-play and that of ordinary-life become increasingly indistinguishable we create the conditions for a cognitive slippage between the two. In other words, it becomes increasingly difficult for individuals to distinguish between immersive or pervasive gamespace and gamic space — ordinary life that bears a resemblance to gamespace due to its adoption of certain game elements.

From man-playing to the reification of the algorithm

It is, at this point, of some importance to disambiguate the relationship between 'play' and 'games'. Play is an innate function of humanity, as Huizinga asserts in the forward to his aptly titled, *Homo Ludens*, man-playing (1). This title is meant to parallel historical and philosophical tropes of human as thinker and/or human as maker. Play, for Huizinga, is of equal importance to both in the philosophical construction of that which humans do, that which defines them, or that which is axiomatic of them as human (1). However, Huizinga is not content to attribute all of the activities of man to the concept of play, to "call all human activity play". For him, such an assertion, while an "ancient wisdom", is nonetheless a "little cheap" (ix). Thus, the thesis of Huizinga's project was not to attribute play to all elements of human life, but instead to explore the play-factor inherent to, and of, culture. As such, "his work is not a study of games, but an inquiry into the creative quality of the play principle in the domain of culture" (Caillois 4).

A game, on the other hand, is a highly specific form of organized play. While Huizinga regularly uses games as examples of, or as analogies for the play principle, he does not create a clear taxonomy of the rule-bound and highly structured nature of the game. However, it is this rule-bound and structured aspect of the game that allows for the third mode by which gamespace and gamic space converge, as it is the specific structural logic of games that can be ported to non-game experiences, and thus establishes the conditions for the phenomenological ambiguity between the game and the ordinary world made over as game.

Thus, in a bit of foreshadowing, let us consider a description of games which owes more to the field of mathematical game theory than to the philosophy of culture or the social sciences. In his consideration of pervasive games,[4] Bo Kampmann Walther, drawing upon economic game theory, defines games as having "three key mechanisms: absolute rules, contingent strategies, and possible interaction patterns" (249). Any single instance of a game is a manifestation of one interaction pattern as determined by the combination of the game's rules and the player's strategies. This analysis of the structure of the game results in the following 'ontological' definition: "Game play is the actualization of a specific stratification of rules, strategies, and interaction as well as the realization of a certain amalgamation of commands, plans, and paths" (Walther 250). In this definition, rules do not simply prescribe the actions a player might take within a game, they also define the closed environment in which the game occurs (thus, excluding the world outside of the game). Extending this logic to understand that any single instance of a game is one of a given set of permutations made possible by the binding rule-set, Walther is able to assert that "there can be no game world without game rules" (251). In this way,

rules structure both the mode of play as well as the game world itself.

Reality made over as 'game'

'The game of life', 'the rat race', 'the dating game'… games are a well-worn (arguably clichéd) metaphor for our lived experience. Economic game theory (along with its extension into the social sciences) extends this metaphor and reflexively reapplies it in order to determine possible outcomes in various prescribed scenarios. Through the highly mathematical study of player behavior in actual games, game theory attempts to devise a means by which individuals' actions in real life might be predicted based on those individuals' characterization as rational actors within an algorithmically describable scenario space. Without going into the mathematical specifics of economic game theory, as they are largely unimportant within this context, this generally accepted conception of the world as algorithmically describable, and of individuals as rational actors, reflects what Katherine Hayles terms *the platonic backhand*; the philosophical/theoretical move from noisy multiplicity to abstracted simplicity (12). Hayles recognizes that such "abstraction is of course an essential component in all theorizing, for no theory can account for the infinite multiplicity of our interaction with the real" (12). She warns, however, of the "variegated leaves" and "fractal branchings" that we lose sight of in the process of such abstraction. For Hayles, the danger in such abstraction is introduced when we view the abstraction as the axiomatic model of the more complex reality. When this occurs "complexity appears as a 'fuzzing-up' of an essential reality rather than as a manifestation of the world's holistic nature" (12).

However, this process of assuming the primacy of the simplified model is the process by which game-like systems (such as Tinder) create virtual manifestations of real world scenarios. Furthermore, in a distinctly modern extension of the application of this logic, these systems create the conditions for what Hayles dubs, *the platonic forehand* (12): "This move starts from simplified abstraction and, using simulation techniques […] evolves a multiplicity sufficiently complex that it can be seen as a world of its own" (12). It is towards this process that Kevin Slavin, particularly in reference to financial and economic systems, refers when he describes "how algorithms shape our world". Referring back to Walther's description of the primacy of rules in the building of gamespace, it should be apparent then that the mode by which rules shape game space is at least analogous to the mode by which simplified models of real space, extracted via the study of game systems, have come to shape our real experience.

The dangers of *the platonic backhand*, the inability of simplified systems in economics, social science or politics to capture or account for all possible cases of reality is well known (Hayles; Gray; Caillois; Taleb). While Nassim Nicholas Taleb refers to the inability of the mathematics of games to appropriately account for the chance of real-life as the "ludic fallacy" (125), Chris Hables Gray notes that "our models of reality are always in tension with reality itself; a model cannot match reality, which is too complex to predict consistently" (29).

And thus, we arrive at the first innate cognitive dissonance that emerges as a result of the slippage between gamespace and gamic space. It is the dissonance resulting from our (often) misguided believe that these simulations are able to accurately reflect the complexity of reality. McKenzie Wark's *Gamer Theory* is built out of his

observation that reality, the world outside of the game, must appear to the gamer as an "imperfect version of the game" (23). Where the algorithmic logic of the game is coherent and comprehensible, the real world seems messy and illogical. The text then, read as a creative work (on a 'meta' level), entreats its readers to critically approach the inability of the game to accurately reflect the real. The gamer as theorist is entreated to "be ludic, but lucid", to draw from the knowledge of the game, a knowledge of the game's structure — its algorithmic logic. It is only once the gamer becomes aware of this codification (takes the red pill) that he will be truly able to see the real's manifestation as game; and to critically engage therein (13).

You are valuable

Wark's text, while entreating us to take the red pill alludes to the temptation to take the blue pill, to disregard the structure and to allow oneself to to be consumed whole, captured in the pure agon. Games are fun; games are fair. Games reward equally and give us clear reasons for our failure. As such, games are seductive. We want to believe in the truth of an orderly system of advancement and reward. And yet, when we allow ourselves to be captured by the seductive illusion of equality presented by the game, we become the oysters of Wonderland, naively following the walrus towards our own eventual mass consumption.

This consumption, this capture is not only of ourselves, within the game, but it is of that which describes us as selves, our data. We are valuable both in our presence (as eyes, as clicks) and in our data (our 'likes', our age, our gender). Thus, it is the desire of the game to capture all of us so it might capture all that describes us. Carmen Hermosillo

wrote about online bulletin boards (the original social networking interface) in 1994:

I began to see that I had commodified myself. […] I created my interior thoughts as a means of production for the corporation that owned a board I was posting to, and that commodity was being sold to other commodity consumer entities as entertainment. That means, I sold my soul like a tennis shoe and I derived no profit from the sale.

As Hermosillo had begun to recognize, this narcissism-as-entertainment creates a profoundly weird relationship between the self, the second self, the other, and the corporation. The data that we wittingly and unwittingly sell to the board, the game, becomes a component of the game; it drives an iterative process of reflexive feedback wherein the rules of the game are modified to mirror our interests as they parallel the interests of the corporation or marketing firm. Our self-reported interests are aligned with those interests of the game and then fed back to us as a reflection of our innermost desires.

Here it becomes possible to identify a second type of cognitive dissonance that occurs due to the slippage between gamespace and gamic space, a dissonance which is situated in terms of our relationship to our avatar (or second self) as an invention of this process of consumption driven codification. The great promise of algorithmic logic has been increased efficiency, to allow us to become better versions of ourselves. Incentive-based systems (such as the fitness trackers) provide a means to objectively view our ordinary activity and a playful way by which we might optimize it. However, these applications also prompt the user to begin to see themselves not as their selves, but as the always-optimizable avatar version of the

self created by the game and in the image of the game. Journalist Nora Young notes the oddity of this phenomenon: "Going about your daily life might become an exercise in performing to expectations. It changes the nature of human agency if I am not just behaving, but responding to an ideal image that I now must measure up to" (30). Young also notes: "It certainly feels as though we are inheritors of a very North American sense of self-improvement, conceived of as a kind of hygiene" (38). Through the perspective of this algorithmic extension of the protestant work ethic — the godly or hygienic drive towards optimization — every moment not devoted to productivity becomes wasted, dirty, and immoral. In our effort to achieve the idealized form of our avatars, we become beholden to the optimization s/he is programmed to require. We become like a Sim, disengaged and robotically driven from one productive task to the next. Perhaps most disturbingly, this logic has begun to subsume not only the traditional space of work, but also that of leisure. LinkedIn, Instagram, and Facebook are tools for the optimization of an algorithmically driven social engagement as prescribed by shadowy corporate interests.

Do you wanna date my avatar?

This strange relationship between the self and the avatar is explored in the comedic web series, *The Guild*. Created by and starring Felicia Day,[5] *The Guild* is plotted upon the initial awkwardness of a 'mmorpg'[6] guild (team of players) that must meet IRL (in real life). By jumping between traditional (3rd person) camera perspectives and confessional-style web-cam interactions, the series gives the viewer direct access to the juxtaposition of the idealized avatar-self and the messy

real-self. "Do you Wanna Date My Avatar?" is one of a series of music videos incorporated into the series which ironically comment on, as well as punctuate, the narrative. It softly pokes fun at the disconnect between the real-life player and their game-world avatar, capitalizing on the temptation to withdraw from the imperfect 'real world' to the safe and perfect 'game world'. This juxtaposition is particularly potent considering the recent rise in popularity of online dating systems such as OkCupid and Tinder, which literally place users in the position of asking: "do you wanna date my avatar?". The playfulness with which the series — and this video specifically — address the disconnect between the player and his/her avatar, who is "hotter than reality by far", invites the viewer to consider the seductive nature of the self as avatar and the strange disconnect that occurs when we aspire to achieve the perfection presented by our online, curated self.

Miranda July's application, *Somebody*, also explores the importance of authenticity and personal connection within an interconnected digital space. The application allows users to select physical proxies (other users) to act as (by proxy) message couriers; messages may include physical interactions (such as a hug) as well as text-based information. The associated marketing video for the application explores the possible absurdities of such 'by proxy' interactions through an increasingly surreal series of juxtapositions culminating in a sexual encounter that is interrupted by a plant requiring water. The work, by re-introducing the physical into a largely virtual interaction space, makes us examine the phenomenological one-ness of our primary and secondary selves. In doing so, it allows participants to critically examine the logic which undergirds our contemporary social interactions within virtual systems and to assess the validity of the algorithmic representation applied.

Are you in or are you out?

The drive towards algorithmic optimization within gamic space is intended as a virtual manifestation of our real-life projects of self improvement. The feedback that occurs as a result of this mirroring between the in-game and out-of-game selves manifests the final dissonance resulting from our ubiquitous adoption of game logic, the misaligned end-game.

Both Huizinga and Caillois agree that the purpose of play exists solely within the 'magic circle' of play. For Caillois, play creates "neither goods, nor wealth, nor new elements of any kind; and, except for the exchange of property among the players, [ends] in a situation identical to that prevailing at the beginning of the game" (10). Thus, the instrumentalization of play through the joint processes of gamification and the application of algorithmic structure is revealed to contain within it an inherent flaw which manifests in the conception of an end, or exit from the game. In gamespace, the way out of the game is built into the logic of the game; it is the point in which a winner or loser is declared and the game's self-contained purpose has been achieved. However, the process by which a player approaches this end is two-fold and contains within it an innate tension.

Walther describes this tension through distinguishing two modes of gamic interaction, playmode and gamemode. For Walther, playmode is that mode of interaction wherein players do not seek to progress through the game's structure (gain levels, follow the narrative) but instead seek only to remain playing, to remain in the space which is not ordinary. Gamemode, on the other hand, indicates the type of interaction wherein gamers are aware of the structure, the rules and actions they must take to progress towards the game's

structurally manifested end-game. The tension between these two modes is a result of the disconnect between the desire to remain in gamespace indefinitely and a desire to win — which must motivate the continuation of play, but results ultimately in an exit from the game (Walther 256). This tension, reflected in our engagement with the ordinary made over as game, leads to anxiety as the invasion of the ordinary into the gamic space not only breaks the reverie of play but also brings to bear the actual, real-life end goal around which the game was (theoretically) focused. This is the point of failure for the simulation, the point from which we must choose to continue or not continue the process begun by the game without the comforting structure of the game.

This freedom creates an anxiety that arises from the misalignment of the end-games in gamic space and in the real, real world. There occurs a rupture between our understanding of the system's intention and the actual logic of the system which may not achieve the intended objective. This rupture breaks us out of the game and reveals the inadequacy of the technology in which we have placed our faith (the game).

This schism between the intentions of the game and the intentions of the player is revealed within Pham and Jamieson's Tinder hack. The hack's use of social engineering to acquire an absurd number of 'likes', which are highly unlikely to indicate real-world 'likes', renders an application that was initially designed as a tool for meeting people practically unusable towards that end. Despite our desire to believe that the Tinder-based end-game, becoming 'wanted' as indicated by the acquisition of likes, maps to becoming 'wanted' in real life, Pham and Jamieson's hack reveals that Tinder's simplified game-logic is simply a mis-aligned end-game: The objective within Tinder does not result in the real-life optimization it promises.

Players vs. Gamers, critically addressing the gamic

There is an established tradition in media arts of using the language of populist media (games, films) to critique the societies from which those media arise. This trend is exemplified by the website Molleindustria, an italian culture-jamming site that creates online flash games and machinima which critique current political and social trends. However, these critiques function not only on a narrative level, but also on a structural level. Molleindustria's management game, *To Build A Better Mousetrap* asks players (cats) to discover an 'ideal' management algorithm through the allocation of labour resources (mice) across a factory production model. In their machinima *Welcome to the Desert of the Real* (created from the Army recruitment game *America's Army*), images of murder (sniping) in a vast and desolate desert environment are juxtaposed with text from soldiers suffering from PTSD. In both of these situations, the radical juxtapositions of both narrative and structure ask the user/player to critically address their simplified views of codified systems such as economics and war. Furthermore, they reinforce the distance between the avatar and the self. Particularly in the case of *Welcome to the Desert of the Real*, the real-world experience of soldiers is juxtaposed against the white-washed, detached experience of the war-game.

In Walther's gamemode, players move through the narrative of the game by reaching various in-game checkpoints and benchmarks required to progress. In doing this, they are not simply watching the game's narrative play out, they are exploring and learning the algorithmic rule space they must navigate and ultimately manipulate in

order to win or to finish the game. Alexander Galloway explains this process of playing with a game while playing through it: "To play the game means to play the code of the game. To win means to know the system" (90-91). There is a distinction created between the average player and the serious gamer. Average players are content to progress through the narrative structure of the game. While they must learn the game logic (the means of play) they do not engage with it critically; they do not 'counter-game'. However, some players — as exemplified by Wark in *Gamer Theory* — prefer to interrogate the algorithm itself. These players co-opt the interface in an effort to discover meta-truths that are manifested within the imposed structure. While, in the case of *To Build a Better Mousetrap*, Molleindustria create a new game — one whose logic and structure reflect the incongruencies apparent in our acceptance of codified systems — their use of the already existent *America's Army* in *Welcome to the Desert of the Real* allows Molleindustria to develop their critique from within. This is the critical space held by the creative practices we have discussed. While the codified systems we use are frequently designed as tools, players must capitalize on the slippery signifiers that result from the application of game-like tropes to non-game activities (including gamification and codification) and fuzz up the boundaries between gamespace and gamic space. In doing so, players are able to reveal the cognitive fallacies that emerge from our acceptance of the codified logic.

Pham and Jamieson's hack exemplifies this critical approach by relying on user's trust of the Tinder system. For instance, Pham and Jamieson modified their profile pictures to appear 'sponsored' by Tinder. Users, as a result of this modification, assumed that the potential match was provided by the Tinder algorithm and dutifully 'swiped right',

revealing that most of us are just average players. In this way, Pham and Jamieson utilize our trust in Tinder's algorithm to reveal the fallacy as well as the danger of such trust.

While it is critically necessary to question the validity of the codified systems we use, we also cannot escape them. When we extend these systems beyond those activities which are clearly games to those activities which have been made like a game (gamic), we realize that engaging as 'normal social individuals' requires our (at least partially) complicit participation. Thus, creative practitioners must interrogate these spaces from within. Like Huizinga's 'cheat', creative activists acknowledge 'the magic circle' while they subvert its internal logic, continuously critiquing its validity. These 'uber-users', who thrive within the slippage between gamespace and gamic space are forming a new class of creative critics that push us to continuously re-examine our datafied environment and our relationship to it while remaining fully implicated participants.

Notes

[1] "Every job that must be done there is an element of fun. Find the fun, and snap! the job's a game!" (Mary Poppins).

[2] Despite the military roots of the heads-up-display, its efficiency in presenting out-of-context meta-data in an immediately retrievable way and the ease with which it could be implemented in virtual game worlds have made it (for now) a visual trope associated with game worlds.

[3] This phenomenon could be viewed as largely unsurprising considering that Huizinga notes an innate function of play is that of civilization; culture, essentially is a manifestation of play, "is played from the very beginning" (52).

[4] Pervasive games are defined by Walther as games which utilize current technologies (such as GPS and WiFi) to create an augmented reality space in which the game is situated. The combination of computational structures in a post-screen setting is inherent to Walther's definition of this type of game (261). However, it is arguable that the current requirement to extensively prepare real-world spaces for the realization of this type of game is more a function of the as-yet-unrealized potential for ubiquitous adoption and coterminous integration of this technology into (at least) urban space and our own bodily space respectively and less a function of an inherent logic of the pervasive game structure. In other words, pervasive games might only require extensive technical preparation because we have yet to fully adopt their requisite technology. An example of this type of game would be the UK-based artist collective Blast Theory's game *I'd Hide You*, which was introduced

in 2012 at the *FutureEverything* Festival in Manchester.

[5] Felicia Day is an internet/nerd-culture celebrity. She is an actress, producer and writer known for her reviews and commentaries on games/gaming as well as fantasy and science fiction literary culture.

[6] MMORPG stands for 'massive multiplayer online role-playing game', such as World of Warcraft or Everquest.

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Winnie Soon

ZOMBIFICATION:
THE LIVING DEAD IN SPAM

[The Zombie] is a soulless human corpse, still dead, but taken from the grave and endowed by sorcery with a mechanical semblance of life — it is a dead body which is made to walk and act and move as if it was were alive.

— *William Seabrook,* The Magic Island, *1929*

Spam appears everywhere on the Internet, from downloaded emails to server-based blogs, forums and social media communications. In 2014, statistics show that the proportion of spam almost reaches 70% of entire email traffic.[1] People might not be aware of this datafied phenomenon because most email systems come with spam filtering software that automatically deletes them or categorises them into a special folder, namely 'Junk' or 'Spam'. As such, spam comes into contact with us in a seamless way, though sometimes it still shows up in our normal inbox folder, bypassing 'intelligent' filtering rules. Spam not only consists of commercial advertisements and enticing titbits, it also comes with peculiar email addresses.[2]

These sender addresses become the identity of spam that show up in an email's inbox. In day-to-day form-filling, from paper to electronic registration workflows, supplying an email address is a mandatory field — equally important as a mobile number — to contact another person. In addition, email addresses come with standard naming conventions; a domain usually belongs to or has a connection with a particular organization or institution. For example, I am a researcher in the Department of Aesthetics and Communication at Aarhus University and therefore the university gives me an email with the domain: dac.au.dk. Sometimes a domain does not only describe the nature of an institution — here the letters 'dac' refer to the departmental name — but

also easily indicates a person's geographical location through the last two characters. When a spam email mixes with other emails that appear in the same inbox, we might think that it is a normal email address that carries a similar structure of metadata — a valid email address that one can reply to. A recipient is usually unaware that the sender address can be easily customized, regardless of its authenticity or whether it exists in a network. Therefore, spammers use new sender addresses to transmit messages, and new identities are created in the network.[3] New spammers are created everyday and therefore we are constantly receiving spam email creating ambiguous effects. On the one hand, sender addresses are actively 'living' and distributed in the network, continually monitored by algorithms; on the other, they consume numerous resources of the network and are regarded as "waste" (Parikka and Sampson 4; Gabrys 67) to be traced and trashed. This repetitive production of the 'living dead' resonates with many films, such as *Night of the Living Dead* (1968) and *The Return of the Living Dead* (1985) in popular culture.

This article explores this notion of the living dead in the context of spam culture. How is spam actively and repetitively produced with different identities? I adopt the term 'zombie' to describe spam because, notably, the concept of zombies has been used extensively in popular culture and entertainment, such as films, games and literature (Boluk and Lenz) to describe the phenomenon of mindless slaves (Seabrook). They are usually situated in an environment that has suffered a viral outbreak with contagious effects (Munz et al; Mahoney; Moore). Critiques have compared zombies to dead labour, such as the slavery in Haiti and the labour in the United States (Fischer-Hornung); that is, the exploitation of labour through the concept of alienation, from Marx's theory (Larsen), and labour

practices in global capitalism (Lauro and Embry). Within the context of spam production, as datafied phenomenon, this paper uses the figure of the zombie to describe the computational and network processes of spam automation, which I call 'zombification' — alluding to the broader topic of datafication and its consequences. The assumption here is that life once datafied is zombification.
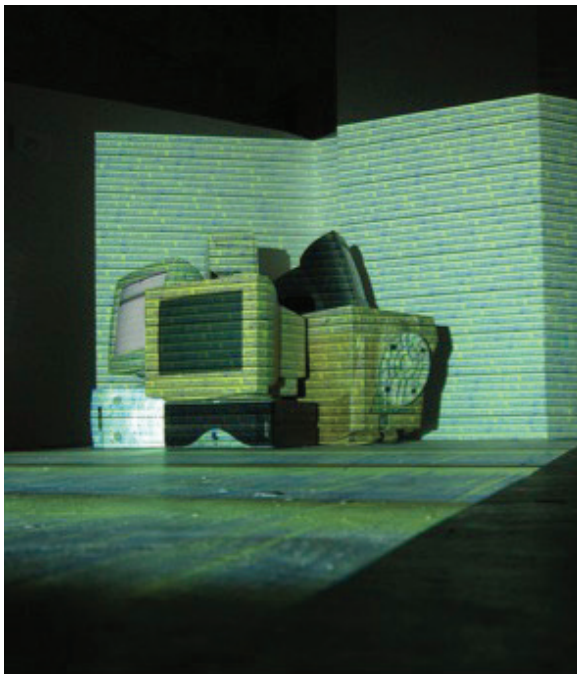
A reflexive approach towards spam

Figure 1: The artwork *Hello zombies* is a network art installation that was exhibited as part of the group exhibition show in Hong Kong with the theme "Tracing Data: what you read is not what we write". [4] It contains three software programs that constantly refresh and display spammer addresses, sending out spam poems and receiving email replies.

Through my installation *Hello zombies* (2014),[5] I investigate these automations at the level of code, and explore how code interfaces with the mail server to create zombies (see Figure 1). I take a reflexive and artistic

approach to research, paying particular attention to the technical and material aspects. This approach is borrowed from the visual arts where the artistic activity carries the notion of what Sullivan describes as "self-reflexive practice" (110). As such it encompasses multiple methods of inquiry; including reflexive process of observation, interpretation, coding, reading and synthesising of code, text and procedures. Drawing on my personal interest in writing computer code and in software studies, the method departs from the thinking of spam content and literature and operates more in terms of spam production. Following the methodological discussion of revitalising 'zombie media', Hertz and Parikka suggest the possibility to discover "new use, contexts and adaptations" to reappropriate unusable technologies (429). How can I reuse spam? My previous collaborative collection of spam poems (a series of literature that is composed entirely from spam content) lends inspiration in this respect. In addition, how can I express the notion of zombification through spam production? Can I compose different spam poems to different recipients, like an automated machine?

With regards to spam, there are a numerous existing discussions: for example, an historical account on how the meaning of spam has changed through technological development (Brunton); a cultural dimension to examine the implications of anomalies such as spam (Parikka and Sampson); artistic methods for spam re-representation (Seiça); the concept of generativity in threatening spam (Zittrain); and the rethinking of spam waste (Parikka and Sampson; Gansing). However, there are few discussions about the cultural aspect of code in spam, in particular the forces through which code interacts with other technical interfaces in spam production. In other words, spam production cannot exist without a programmable machine. The core focus of programmability is based on the

examination of computer code and technical interfaces in order to understand the cultural aspect of an automated machine. Added to this, the notion of zombification constitutes a post-human body (Castillo 167) that follows computer instructions and standard technical interfacing format, producing massive data autonomously and endlessly. However, this data only temporarily exists in the network as it is deleted or blocked by machines or humans. Mutable identity is needed in order to pass through different checking logics and algorithms and to reach the target end. The mutation is achieved through the continuous reading and writing activities of machines. According to Castillo, post-human zombies are without "anima"; they "are animated instead by an outside force" (167) — in this case a programmable machine.

During the coding process, I reflect on the ways in which a spammer captures and composes data from the network. Instead of having a standalone program to compose emails, other interfacing entities such as mail servers and data files are required to compose an email production line. One needs to have a mail server in order to send out high volume emails, but most hosting servers set a strict sending limit per day unless one rents a virtual private server (VPS).[6] An email program is also required to state the parameters that negotiate with a mail server, such as mail domain, username, password, sender address, receiver address, mail subject and mail body. Sending out high volume emails requires reading different data input, and a recipient address, for example, for each email; therefore, a customised program needs to be used, other than a common email client such as Outlook or free internet accounts. However, email marketing is a massive business, and one can pay and rely on companies to provide a sophisticated emailing solution, thereby escaping a complex infrastructure setup.[7] Regardless of

any provided standard software or customised program, composing and sending high volume emails requires computer code that deals with file reading and data processing with a server. As such, code contributes significantly to the process of spam data quantification and automation. However, the role of code cannot be taken for granted from a purely technical perspective in spam production. Instead, these technical structures, the operative dimension and interfacing format allow for a cultural and aesthetic understanding of spam. In other words, the approach is about more than spam as a study object, or questioning what is spam, or the content of spam. Through "the creative inquiry process" (Sullivan 104) of making *Hello zombies*, the actions of my practice and the theoretical reflection are intertwined, mutually informing each other to achieve self-reflexivity.

Mutating parameter value: addresses from senders to receivers

According to Boluk and Lenz, the characteristic of mutation constitutes a zombie as "a force of evolution", through a "biological model of viral infection" (6). This concept of mutation extends from the biological to a technological model in the twenty-first century, where computer bots and agents are self-modifying through intelligence algorithms and social connectivity to become datafied zombies that invade the network. One of the lists from stop forum spam, an online provider who supplies spammer information, contained around 23,000 spam email addresses for just one day.[8] The list is continuously updated, also with information from network communities. Updated hourly, it is also used in *Hello zombies* to

feed in email addresses to the automated machine.Indeed, spammer addresses can be reported online, and once the address is identified, the email will be added to a block list. Hence, this information will be distributed widely throughout the network. Institutional email systems will then use this list as a base to update their screening processes. According to Spamhaus, an international non-profit organisation that does spam tracking, more than two billion mailboxes are using Spamhaus's blocklists to filter identified spam.[9] In order for an email to enter a mail's inbox folder successfully, not only does the email content need to be customised, the identity has to be carefully considered, so spammers need to change their address in order to escape being caught. This detective mechanism of spam regulates the possibility of its appearance in the client network and the lifespan of a specific spam's identity. But the social life and the distribution of spam is not solely a matter of commercial activities and technical operations, or limited to "a human intentional individual actor" (Latour 7). It is important to also consider the agency of spam (from Latourian actor-network theory), the suggestion being that actor-networks extend "actor — or actant — to non-human, non individual entities" (2). The force of spam comes from the ever-mutating characteristics of spam production and its zombie agency.

Among the spammer email addresses are some real ones, with actual users who are currently using them. Indeed it is fairly common to receive reported cases from the Internet where users' email accounts are being hacked. These hacked mailboxes secretly send spam out as if from actual users.[10] In distributing spam, the field of the email address is easily faked in a computer program: one just has to configure the value of the parameter — sender address, and it can bypass mail servers. Consequently, an automated system will execute this stated piece of information mindlessly, attaching it to every email that it is going to send out. In other words, there is no checking of the validity of a sender email address, so zombie identities could come with faked and non-identifiable addresses but they also include ones of living persons. However, once they have been tracked, zombies require a new identity to keep the continuity of producing quantified data. Therefore, each zombie identity is paradoxically temporary and generative: the identity keeps mutating over time. This mutating quality is similar to the popular game Zombie Farm,[11] where zombies change their body parts to look differently in order to obtain higher success in harvesting. The process is hardly stopped when spammers switch their identities to obtain higher reaching rates as contagions, spreading across the network.

In spam production the configurable parameter, that is the sender address in this case, allows the corresponding value to change easily without impacting the entire production line. It simply replaces a value with another email address. However, this changing parameter value in computer code is not merely a data configuration, but as Neff and Stark put it, also the "information architecture is politics in code" (186). Code, in this emailing context, also includes "technological and social systems" that reshape the value of such email address parameters (Neff and Stark 186). The mutable values have a political condition. The longevity of a zombie's identity is affected by the social demand and the technological development of spam tracking, hacking techniques and security infrastructure. The changing values of such parameters are what Neff and Stark put forward as "political valence" (186).

Similarly, we can also apply the mutating concept into the parameter of a receiver address. This data has enormous commercial value through the reselling of email

addresses. Harvesting live data with active email addresses is arguably one of the most challenging parts for massive emailing. Security is continuously enhanced in email system and filtering rules, and the web checking logic that differentiates robots and humans is becoming more sophisticated. Computer agents, such as web crawlers and web bots, use different ways such as web data mining,[12] spoofing attacks and dictionary attacks to harvest valid and close-to-live addresses. On some occasions a real email address is stolen through spoofing attacks, where spammers "get names and addresses through compromised email accounts, which give them access to contact lists" (Yeaton). Whilst in dictionary attacks, spammers use obsolete and invalid addresses to generate a new recipient address, that is, close-to-live, by slightly amending the username and replacing the old email domain (such as the change of email address from james1@hinet.net to james@hotmail.com) (Clayton).

The value of the receiver parameter stands for an actual target, and it is constantly mutating at code level (see Figure 2). According to common knowledge, one could input more than one target recipient in the carbon copy (cc) or blind carbon copy (bcc) field of an email client interface. Nevertheless, an email server follows a protocol specification that processes addresses one by one through command-line communication in the form of code.[13] The specification "prescribes how the data should be formatted, the type of data allowed" (Hall 13). This is what Alexander Galloway refers to as "network control" (xix). He explains, a "computer protocol is a set of recommendations and rules that outline specific technical standards". On the one hand, these are technical standards; on the other hand, these "govern the set of possible behavior patterns" as "regulations" (6-7). Regardless of the sender address, a mail server will check the validity of a receiver's

address. The checking by mail servers includes the validity of the domain, the receiver address, the sending limit and so forth.[14] At the operational level of code, executing such spamming programs means submitting data for an email server's regulatory check. As such, code cannot escape from the process of network control. In view of the receiver parameter, email servers constantly receive different lists of emails through coding interfaces. These addresses are mutating at the level of code based on the receiver addresses that are found from computer agents. What I want to suggest here is that it is crucial to understand how a program and a system works in order to examine the mutability of code. The parameter of an email address is more than the actual value of it (in the form of numeric and alphabetical value). Indeed, this mutable quality constitutes the entire production chain of spam as, I argue, it is not simply a data configuration that substitutes any data and any value of a parameter. It also contains other cultural significance such as regulatory control and social connectivity, as mentioned. Furthermore, only a receiver address has validity checks while the sender address does not. This loophole facilitates the generation of mutating identities as email addresses in the network. Computationally, it is the mutable quality that allows the parameter value to be changed. When a programmable machine keeps processing scripts and programs, it becomes automated while it is constantly producing quantified data. This undeadness of automation is part of spam culture.

Figure 2: A screen shot of the *Hello zombies* program that highlights the variables of sending out an email. The fields 'FROM' and 'TO' are two parameters where any address value can be configured.

The undead writing of automation

With respect to spam production, it does not come from one machine: many of them are running continuously in the Internet, generating quantified data like a zombie herd. Ratliff describes it as the process of "herding", where a massive number of zombies receive code instructions to invade the network. Zombies do not have a physical body but they possess a temporal identity and a body of text. They may not survive for long but even if one is being trashed, there are still many others around the network. Boluk and Lenz draw upon Lauro, Embry and Weinstock to discuss the zombie as "a figure of undead labor and consumption" that "is simultaneously a figure of pure automation, of programmed memory that infinitely loops" (7). Zombies are regarded as undead because the automated process minimises human intervention and optimises labour practices. All the digital labourers, such as computer agents and computer job schedulers (also known as 'cron jobs') have contributed significantly to the process of automation. Email scheduling can be set in advance to wait for a more effective time to be distributed. In addition, email lists can be continuously fed into the programmable machine. Once the structure is set up, computational parameters, such as sender address, recipient address and body of text, can be mutated in different combinations. As a result, quantified zombies are being distributed from the automated computational process.

Code plays an important role in structuring such an automated system, for example: the flexible and mutable parameters, the ability to interface with other systems and the infinite looping process of high volume data. Drawing upon earlier concepts of object-oriented programming language from Kristen Nygaard, inventor of the first object-oriented programming language,[15] programming is not only a matter of solving technological problems but is "intended to simulate complex real-world systems" (Lundby 8). Regarding Nygaard's earlier invention of *Simula* (in the 1960s), many of the concepts, such as schedulers and automatic memory management, are still used in programming languages, which supports concurrent scheduled production and automatic garbage collection that is no longer in use by a program. These enable an efficient and smooth running program as well as a streamlined writing process. Therefore, the structure of programming is fundamentally facilitating the undead processes of automation.

A program contains coding instructions, and these instructions become a score for a machine to run and execute. The automated spam production is also understood as a repeatable writing process, where machines write and perform; according to Wendy Chun, "[No] matter who wrote it or what machine it was destined for; something that inscribes the absence of both the programmer and the machine in its so-called writing" (42). As spam text is generated through computation, we could, therefore, also say code writes spamming emails. From a confining process of computation to a wider framework of capitalism, spam increasingly appears in different sectors and advances its functions. Spammers not only send out bulk messages to promote commercial activities, they also collaborate with hackers "to attack networks, destroy cyber infrastructure, hijack computers, spy on private/confidential data, obtain privileged information (for example: weaponry, industrial secrets, identity theft, other classified information)" (Potdar et al 826). If one of the characteristics of the zombie is the notion of undead, this assertion does not

only describe the nature of its programmable emergence, it is also about how to obtain infinite transactional data through digital consumption such as different email address harvesting methods, that have been mentioned. Digital consumption and production are highly related to networked capitalism, and these two levels of undeadness are, indeed, intertwined.

The reflexive practice of *Hello zombies* examines the notion of the living dead in a speculative way. Setting up an automated production line in *Hello zombies* includes writing computer scripts to fetch spammers' email addresses automatically (these email addresses become the recipients in the artwork); producing and distributing a customised spam poem every eight seconds; reading and extracting any email replies in real time. These computer logics allow a spam email to be fully read by an audience via a screen display, as well as creating a continuous loop to extract new recipient addresses and receive new email. This process-oriented and software-focused approach (without human supervision and direct intervention after code is run) is commonly found in net art and software art practice, such as in *Endless War* by YoHa.[16], and also in *Hello zombies*.

At the practical level of code writing and reading, *Hello zombies* functions and performs according to instructions, but writing code also is a way of self-reflexivity as Chun affirms: "code offers us to think about pleasure, agency, action, danger and, indeed, theory" (Chun, "Codes, Crises and Critical Pleasure"). It reflects upon the datafied condition of both quantified and automated zombies at the level of code. Code associates with data capturing, network protocols and computational processes in the automation of spam production. Thinking about how spam is mutably written enables the understanding of its agency too. Zombies are undead: they are repetitively produced

through different forms of writing: writing to mailboxes and writing for data capturing and processing. Computationally, Chun, however, reminds us that code is a process of "undead writing, a writing that — even when it repeats itself — is never simply a deadly or living repetition of the same" (177). This characteristic of undeadness is not only happening in spam production but also in many other automated network activities that are seamlessly in touch with us, like spam, to produce quantified data in the network. They use a personalised and customised approach to invade the network. In fact, most of them do not have a real identity but we are cohabiting with them. This undeadness — or zombification — suggests attention to the material level of code and the corresponding automated processes in a wider cultural context where things exist temporarily but are constantly reproduced in the network without any real identity.

Zombification in software culture

Zombification describes computational processes of production, addressing the mutable quality of automation. Spam consists of mutating identities. It is continuously and seamlessly produced yet temporarily exists in the network through computation. This temporal existence of the living dead, as I argue, encompasses code automation — an undead and repetitive writing process where a parameters' value is constantly mutating. However, zombification does not only examine the technical dimension of computational processes. This paper tries to articulate the mutable quality at the coding layer, examining its surrounding forces, such as the interface format of a mail server and

an email address, the consumption techniques of email addresses, the parameters and values of a software program, and the repetitiveness and undeadness of writing. Thinking from such material and technical aspects of spam, particularly mutability, we gain a better understanding of spam culture that is associated with its mutating identity, including regulatory controls, loopholes, labour practices, digital consumption and datafication. The computational process of such automated production is part of spam culture that has been somewhat overlooked. Production of spam entails not only automation but also the characteristic of mutability. Through the artwork *Hello zombies*, the critical and aesthetic possibilities of zombification are demonstrated to address the ever-changing datafied phenomenon of digital culture. Indeed, the idea of zombification could be extended to other kinds of software activities that produce quantified data through automated, mutable and programmable machines for qualitative ends.

Acknowledgements

Notes

[1] Spam report (2014): http://securelist.com/analysis/monthly-spam-reports/58559/spam-report-february-2014/.

[2] Examples of such email addresses are naomiwhitfield274@trash-mail.com and *****@gmail.com. Spam email addresses can be found in stop forum spam: http://www.stopforumspam.com/downloads/.

[3] However, many of the email addresses do not exist in the network and are easily identified as spammers. The sender address appears to stand as a proper identity and as such is ready for others to reply to.

[4] The concept statement of the exhibition, *Tracing Data*: http://www.writingmachine-collective.net/wordpress/?page_id=76.

[5] The work *Hello zombies* requires an Internet connection that runs several customised programs on the fly. It examines "nonhuman zombies as a cultural phenomenon that produces quantified data and network identities" and "the living dead that bring forward social, technical, capitalistic and aesthetic relations in everyday lives." (Writing Machine Collective, 2014) The work responds critically and aesthetically on the wider notion of automated writing and reading in a digital art context. Details on *Hello zombies* can be found at http://www.siusoon.com/home/?p=1273.

[6] Details about setting up an email system for mass distribution: http://www.slideshare.net/anissasimpson900/setting-up-a-email-marketing-system.

[7] Examples of companies who provide email marketing solutions: Amazon SES: http://aws.amazon.com/ses/details/ and MailChimp: http://mailchimp.com/pricing/high-volume-sender/.

[8] A snapshot as of 17 September 2014. The updated list can be found here: www.stopforumspam.com/downloads/listed_email_1.zip.

[9] The figure is as of Sept 2014. See the Spamhaus project here: http://www.spamhaus.org/organization/.

[10] See some examples of reported cases here: http://askleo.com/why-does-my-account-keep-sending-out-spam/ and http://lifehacker.com/5875848/how-can-i-find-out-why-my-email-account-just-spammed-my-friends-and-family.

[11] Zombie farm is a mobile game. See the link here: http://zombiefarmgame.com/.

[12] See different ways of harvesting email addresses: http://www.private.org.il/harvest.html.

[13] See the full document of SMTP mail server protocol specification here: http://www.ietf.org/rfc/rfc2821.txt; A SMTP command 'RCPT" is required to communicate with mail server.

[14] See the list of SMTP error messages here: http://www.serversmtp.com/en/smtp-error.

[15] Nygaard defines Object-Oriented Programming from the following perspective: The computing process is viewed as the development of a system, consisting of objects (components), through sequences of changing states. See his earlier article: Nygaard, Kristen, 1986: "Program Development as a Social Activity", *Information Processing* 86, H.-J. Kugler (ed.), Elsevier Science Publishers B.V. (North Holland), IFIP, 1986 (Proceedings from the IFIP 10th World Computer Congress, Dublin, Ireland, September 1-5, 1986), 189-198.

[16] In 2014, *Endless War* was exhibited together with *Hello zombies* in Hong Kong as part of the Writing Machine Collective (5th edition) on the theme *Tracing Data*: http://www.writingmachine-collective.net/wordpress/?p=489.

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Lea Muldtofte Olsen

GRAMMATIZED PSYCHOPATH: AMERICAN PSYCHO ONLINE AND OFFLINE

***Dress like a secret agent**, Fitted dress shirts and jackets for the modern man by Saboteur, www.saboteurman. com (Cabell and Huff 320)*

Published in 1991, *American Psycho* by Bret Easton Ellis presented a terrifying first person portrait of Patrick Bateman — a Wall Street banker and an industrious serial killer. Bateman, through his own voice, is revealed to be a narcissistic, status-obsessed perfectionist who not only thoroughly describes his own actions of torturing and executing, but also details his extreme regime of self-maintenance, his fixation on others' and own appearance through corporate brands and his obsession with popular music.

The artists Jason Huff and Mimi Cabell rewrote Ellis's text in their piece *American Psycho 2010*. In order to make a present time version of the novel, *American Psycho 2010* was made by sending the text of Ellis's *American Psycho*, page by page, between two Gmail accounts. The resulting Google-generated advertisements were kept as footnotes while the original text was deleted. *American Psycho 2010* consists henceforth of 800 ads as footnotes corresponding to the voice of Patrick Bateman.

I will here argue that this rewriting, moving from offline to online (and back to offline) literature through Gmail as a filter, not only manifests a here-and-now alternative, consumeristic portrait of Bateman co-authored by Google's algorithms' interpretation of the text, but also elucidates a reading and writing otherness. This otherness, the underlying workings of the algorithms, is performing within its own discourse, which we emulate in our daily email correspondence. Thus Google is reading and producing us as datafied consumerist subjects through these parallel reading and writings of our own reading and writing online.

In order to clarify this argument, I will use the notion *grammatization*, where I for the greater part of my argument will draw on Jacques Derrida and Bernard Stiegler's use of it. Stiegler relates to Jacques Derrida's reading of Plato (in *De La Grammatologie*), where Plato describes the act of writing as mnemotechnic (Stiegler, *How I Became a Philosopher* 41) — a technique of memorizing. Grammatization then implicates an exteriorization of consciousness and, consequently, an exteriorization of memory. Alphabetization as the exteriorization of consciousness through the phonetic alphabet, also called grammatization, hence means making the interior into concrete, discrete units — making something into grammar, patterns and code. And since the thoughts, when grammatized, are units 'out there' instead of abstractions 'in here', they can be infinitely duplicated and distributed independently of us. Following this, when we describe and inscribe ourselves in grammatizations in different contexts, we exist somewhere 'out there' as grammatized. I will argue that *American Psycho 2010* represents a process of grammatization in our everyday communication online: by Google's algorithms, as online users of communicative media, and through our own written and read words we are being grammatized. Consequently, communicating online equals a double grammatological process: the self-grammatization from our own 'pen' and a simultaneous datafied grammatization from, in this case, the search engine algorithms of Google. So how can we re-introduce and discuss grammatization, when the grammatization is datafied?

Forgetting, memory and history

In *De La Grammatologie* from 1967, Derrida introduces what he suggests as a science of writing, *grammatology*, which becomes — as throughout the book he deconstructs science and philosophy of language within itself — a science of philosophy, history, a science about science or a science about everything constructed through writing. This is in order to reject any kind of metaphysics, any kind of origin. Discussing speech and text, both encompassing an exteriorization of consciousness, writing is to be understood as language graphically externalized, for instance constructed within the technical system of the phonetic alphabet.

Derrida proclaims that language is not neutral, on the contrary it is a system with an independent reality, a system with its own structures, affecting how we apprehend, understand and construct ourselves and our surroundings. He adds to this an understanding of an 'arche-writing' meaning a nonorigin, which he also calls 'the trace' or a spoor of an inscription or engraving. He writes:

> *The trace s not only the disappearance of origin — within the discourse that we sustain and according to the path that we follow it means that the origin did not even disappear, that it was never constituted except reciprocally by a nonorigin, the trace, which thus becomes the origin of the origin. (61)*

In other words, Derrida's insertion of a nonorigin opens up for an understanding of a constitutive absence that clears the way of anything present, which refers to the logic of binary oppositions. In the preface to *Of Grammatology*, Gayatri Chakravorty Spivak

in clarification explains Derrida's arche-writing or trace as "the mark of the absence of a presence, an always already absent present, of the lack at the origin that is the condition of thought and experience." (9) The mark of an absence is constitutive to the presence of writing as such.

In addition to installing a constitutive nonorigin, Derrida also aims to annul — in the period of the publishing of *De La Grammatologie* — the dominant philosophical tendency to place speech over writing. This favour of the spoken word means for instance to give prominence to speech as being closer to thinking – closer to sense and the natural — and simultaneously to accuse writing of "clothing" speech as a "garment of perversion and debauchery, a dress of corruption and disguise, a festival mask that must be exorcised" (35). In response to this accusation, Derrida points to the omission that speech is an exteriorization of the interior just like writing. Speech is not a direct, pure channel to consciousness; it is a signifier of whatever is signified as well.[1]

Confronting this tendency, Derrida refers to *Phaedrus* in which Plato is deeply concerned with grammatization as a graphical exteriorization in relation to memory. In *Phaedrus* Plato compares writing with speech as *hypomnesis* with *mneme*; the supplementing help versus the vivid, natural memory. Thus, according to Plato, writing equals forgetting, since it is:

> *denouncing the being-outside-of-itself of the logos in the sensible or the intellectual abstraction. Writing is that forgetting of the self, that exteriorization, the contrary of the interiorizing memory, of the Erinnerung that opens the history of the spirit. It is this that the Phaedrus said: writing is at once mnemotechnique and the power of forgetting. (37)*

However, as Derrida and later Stiegler shows, the process of grammatology is how we make and have been making history, collective and individual memory as well as construct members of a society. We exteriorize and engrave our actions and ourselves in descriptive grammatizations (most basic: date of birth, death and social security number) so that others can know us and re-know us, even after we are gone. And more importantly, Stiegler stresses, while we describe and inscribe ourselves outwardly, we simultaneously inscribe and interiorize these descriptive grammatizations within ourselves in a process of getting to know ourselves. It is a process of *becoming* ourselves. According to Stiegler, grammatization is therefore also a constitutive foundation for a feeling of belonging; a constitutive function from where a possible individuation of subjects can be derived, since it enhances the individuation of a we, a society. In a generic process this collective understanding of a we co-constitutes the psychically understanding of the subject as an I, which again confirms the we and so forth. Stiegler writes: "I am not human except insofar as I belong to a social group", which is an understanding he collects from Aristotle (Stiegler, *How I Became A Philosopher* 3). A possible co-individuation of a *we* and the *I*s involved in the *we* is thusforwarded by a descriptive grammatization of social relationships.

Stiegler provides another relevant and important layer to Derrida's grammatology. He expands grammatization to be more than alphabetization, to include any formal system, which encompasses cultural representations, products and communication technology (*What Makes Life* 49). These grammatized representations, I would argue, equal the arche-writing of Derrida and works as a cognitive and corporal archive or trace of intergenerational memory, a present absence, which provides the constitutive

possibility for a 'presence', for a *presenta*tion, a re-writing of oneself, a process of individuation.[2]

Fictional grammatization: I simply am not there

When viewing Patrick Bateman as the narrator in Ellis's *American Psycho* through the lenses of the above described theory, the figure Patrick Bateman, his actions and his thoughts are born from text and he exists only as grammatized. Bateman is nothing but written. However, being fiction as such and thus a product of the pen of Ellis, Bateman is a *re-presentation*, a metaphor of reality. Thus, Bateman could be viewed as a representation of how grammatization produces the subject, who undergoes the grammatological process.

If we add to this Émile Benveniste's theory of enunciation and the focus of the subject-constituting personal pronoun, Bateman is a represented subject of enunciation; his enunciation(s) is an enunciated enunciation. (Ellis is the actual subject of enunciation.) Following Benveniste in *Subjectivity in Language*, the personal pronoun I is to be understood as an empty signifier, which only refers to the speaker, who utters it in a present time discourse (244). Thus, the I in an enunciation is not referring to a pre-existing substance of subjectivity, but exclusively to its own 'taken-place' in a here-and-now discourse. And since this empty signifier, when appropriated by a human subject, refers only to the event of the enunciating activity and not to an exterior reality, the subject of enunciation is inevitably also de-subjectivated and expropriated in its appropriation of language (Lund 71). This explicates the point of the grammatological

process understood as the appropriation or the exteriorization of consciousness through language: Grammatization is at once both representing *and* producing the human subject involved. Within the enunciation and therefore also within the grammatization, the *I* is empty and as a result also always already absent within its own discourse.

Bateman represents this process. As he enters the position of the speaker and becomes the subject of the enunciation he is consequently also represented as absent, which turns obvious as the narration develops. Here, his psychopathic features, his inhumanness, complete lack of empathy and compassion seems to apply perfectly to the appropriation of language, which, as we have seen, automatically means a simultaneous desubjectification and expropriation. Throughout the narration, one could argue that even though, and because of, Bateman's repetitive re-inscription of himself, which stems with his appropriation of a first person-I, he is "sous rature" (Derrida 48), he is "under erasure". Approaching this, Jacob Lund cites Judith Butler, when he writes: "The more one seeks oneself in language, the more one loses oneself precisely where one is sought" (70). Compulsively keeping up his appearance, while simultaneously losing the 'human' within himself together with affects and feelings, Bateman as a psychopath is an exemplary illustration of this loosing oneself "precisely where one is sought". Notably, Butler refers to language in general or language as such. In *American Psycho* the 'language' in which Bateman loses himself is a commercially expropriating language or spectacle (which is why he is so beautifully painted by Google's algorithms in the 2010 version). He represents the function of a constitutive absence in a grammatological process. Even Bateman himself articulates his process of being under erasure, of losing himself in different contexts:

[T]here is an idea of a Patrick Bateman, some kind of abstraction, but there is no real me, only an entity, something illusory, and though I can hide my cold gaze and you can shake my hand and feel flesh gripping yours and maybe you can even sense our lifestyles are probably comparable: I simply am not there. (Ellis, 352)

[M]y normal ability to feel compassion had been eradicated, the victim of a slow, purposeful erasure. (265)

The character Bateman represents the constitutive absence of one's own presence in the grammatization and further illustrates how we are at once represented and produced in these grammatizations. The uttering "I simply am not there"is in its contradiction directly applicable in relation to the appropriation and expropriation in the enunciating activity.

consumersearch.com

So what happens when the grammatized Bateman is re-written into a double grammatological system of both alphabetization and the algorithmic system of Google's Gmail and search engine? What happens when the Google-generated advertisements are also within the construction of enunciation? Cabell and Huff show us a snapshot of the result from a specific day in 2010. In the 'narration' of *American Psycho 2010*, Bateman is not only represented and produced through language and hence writing, his represented I has also undergone a parallel reading and writing process performed by Google's algorithms in a discourse of consumerism. He is represented as the consumer the algorithms

predict him to be. Within the narration in Ellis' novel, Bateman as an empty shell is produced by corporate brands representing him in the narrative, which the 2010 version illustrates perfectly. This version even leaves the alphabetized Bateman behind, deletes him, leaving him literally expropriated, desubjectified and eradicated. The literal erasure explicates the fact that within this construction of enunciation he is also reduced to a subject of consumerism, when authored by Google; consumerism since it is the only language and thus the only system describing him.

As an example, the utterance of Bateman, which is underscoring the constitutive absence and the desubjectification within the apprehension of language "I simply am not there", corresponds to footnote 781 in *American Psycho 2010*, relating to an absurd invitation to click onthe link *consumersearch. com* (Cabell, Huff 385). Consequently, even when under erasure in alphabetization, Google's algorithms find a way to reproduce and invite one to re-write (or re-click) further into its system. In a palimpsestic self-production and deletion, one could then re-inscribe oneself in a hyperlinking-actvity — constantly 'sous rature' in Derrida's vocabulary. This activity begins with an offer; in this case an offer to literally seek oneself as a consumer — *consumersearch* — thus losing oneself, erasing oneself again "precisely where one is sought".

Google is the psychopath

Moreover, it is interesting to notice that Google's algorithms and corporate sponsors are completely indifferent towards the description of the person to whom they make the offer, even if the narrative is Bateman describing himself killing a child at the zoo and

leaving him in a trash can. The corresponding footnote says: "Recycling Containers, Buy your plastic recycling containers here. We can customize. www.nwpackagingonline. com" (308).

The ads will customize their offers to the individual — and it makes no difference whether the individual is a disturbed, shallow, psychopathic killer. Somehow this indifference towards the *I* exterior to the discourse resembles the condition of the possibility of becoming an *I* through language. Situated in a corporate context, the indifference towards the personal being of the human, which in this case is Bateman, illustrates the algorithms as non-emotional and inhuman, but however also smart and intelligent actors in the writing and producing process. One could argue that in *American Psycho 2010*, it is not Bateman but Google that is representing a true psychopath.

Turning to Stiegler and his productive theory about co-individuation and its negative antipole dis-individuation, in this particular case of Gmail, Google's algorithms use keyword identification within Patrick Bateman's utterances to write him as a consumer entity, mapped to Google's corporate sponsors. An alternative portrait of Bateman as a mere consumer is manifested in the resultant ads. In Stiegler's vocabulary, instead of the *I* as the grammatized subject individuating within a grammatized *we* in a conversation through Gmail, the *I*s and the *we* are considered a *they* by the algorithms of Google, a collection of consumers, not individuals. This parallel reading and producing thus implies a loss of individuation. This becomes remarkably literal and explicit in *American Psycho 2010*, where Patrick Bateman's utterances, self-description, history and memory are literally deleted — even Bateman as an extreme psychopath is read and written by a corporate algorithm, which means he is reduced to a mere consumer like everybody else.

Here, he is painted by the prediction of algorithms anticipating his desires.

Grammatized datafication

Grammatization as the exteriorization of memory, and hence a mnemotechnic, is also pregnant in *American Psycho 2010*. By writing and apprehending language, the interior is engraved and exteriorized 'out there' as Derrida and Plato have taught us, and which has been illustrated in Ellis' *American Psycho*. Stiegler makes the point that it is through and within these grammatizations that an individuation and a re-installing of the personal being of the human can take place. While taking one more step in thoroughly explaining the notion of grammatization, he calls them 'pharmacological phenomena'.[3] This means that cultural products such as cinema, television, social networks, technology equal medicine or drugs in general are both poison and cure — potential facilitators for both individuation as well as dis-individuation (Stiegler, *What Makes Life Worth Living* 50). He argues that in the exteriorization of the interior a diverse process is taking place, where the grammatizations change us inwards as we use them outwards; they re-open a space for a process of *becoming* through the exteriorizations. The *what* (being the grammatizations) is creating the *who* as it is created by it, so to speak. In this light the grammatizations are not only memory 'out there', they also constitute a memory and a knowledge about ourselves 'in here'. However, according to Stiegler, in this interiorization of grammatizations, we are also in danger of being 'deleted' or dis-individuated, when the grammatized products are strategically programmed to do so (Stiegler, *Symbolic Misery* 110).

Moving into the digital, the self-grammatization, the self-engraving changes. Within the network of Google, we are not only constituted as subjects within language, but notably every click and every bit of text (being our online-activity referring to ourselves as speakers or 'clickers' in a here-and-now discourse) are tracked, indexed and algorithmitized by a network that is constantly and invisibly reading our writing and writing our reading. In other words, what problematizes the circumstances is the fact that the difference between a self-description, a self-desubjectification offline and online is that a self-description online is also an instant self-indexication — it is traceable. One could say that by apprehending the personal pronoun *I* online, one does not only exteriorize and inscribe oneself in a history and memory of letters; you are also remembered within an algorithm that performs on its own, independent of the *I* involved. The dis-individuation is complete; the algorithms apprehend the first person-I for you. Thus, the *I* is not even present in its own de-subjectification. As a result, Google's memory is 'too good' compared to the phonetic alphabet.

American Psycho 2010 in a comparative analysis with Ellis's *American Psycho* is thus an exemplary illustration of how this offline to online changes the grammatization. *American Psycho 2010* is a *representation* of the *production* of subjectivity. A production constructed by the algorithms of Google. This also implies that if Cabell and Huff ran Bateman through two new Gmail accounts today (2015), the portrait of Bateman would be painted by other ads, which only emphasizes how the self-activated performativity of the algorithms works. I would argue that the aesthetic practice of *American Psycho 2010* recognizes the Google-algorithmic system and makes a re-negotiating possible. The 2010 version reflects the current state of online writing, and could potentially install a

conscious reflection and awareness in us of how Google works, how it generates the ads it does and, in the words of Lori Emerson in *Reading Writing Interfaces*, how "it sells ourselves and our language back to us" (location 2666 of 4314). One could hope that a reading of a work like this push forward a re-installing or a re-claiming of the first person-I, which means at least an awareness of what happens, when language is appropriated online.

In conclusion, I would argue that the inscription of oneself online demands for an even broader or different formulation of the notion of grammatization. While the analogue construction of enunciation in Ellis's *American Psycho* begins and ends with the phonetic alphabet, *American Psycho 2010* illustrates a whole different digital problem; the algorithms perform, act and remember, even after the *I* has left the keyboard and the inscription is done. As psychopaths they act without compassion, they produce the subject in corporate systems, they re-write the subject — the desubjectification 'stays' so to speak. I would suggest a descriptive notion of 'grammatized datafication' for this purpose, which encompasses the double process of being grammatized and datafied in a self-description online.

Notes

[1] In fact, according to Derrida, speech is always in itself a writing, which means that it is always an expression of or a trace of writing.

[2] Stiegler's notion 'tertiary Retention', which he has developed from Husserl's 'primary retention' (experience) and 'secondary retention' (memory), is notable, since it is to be understood as the artificial 'container' of memory. Stiegler present this philosophy in *Technics and Time, 3: Cinematic Time and the Question of Malaise*. In fact, tertiary retention is grammatization understood as technologies and media of memory. In further readings of datafied grammatizations, this notions needs to be included and unfolded. For this article, the understanding of grammatization is first and foremost the main focus.

[3] Before Stiegler, Derrida deconstructs the term in an analysis of Plato's *Phaedrus* in his piece: "Plato's Pharmacy".

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Daniel C. Howe

SURVEILLANCE COUNTERMEASURES: EXPRESSIVE PRIVACY VIA OBFUSCATION

[T]o radically automate and to automate radically as a careful ethical and aesthetic gesture. (Munster)

The ubiquity of the web-browser as an interface to the web, and to digital content in general, has by now surpassed that of any other software entity. Some designers have even made the case that the browser represents a key locus for the inculcation of obedience in contemporary society. On each page we are forced to learn or adhere to the rules of a different set of site designers or administrators without any say whatsoever in what those rules might be (Zer-Aviv). Whether or not one accepts such claims, the browser remains a key focal point for much of the surreptitious data gathering and surveillance that pervade the web. As researchers have shown, there are a multitude of vectors by which corrupt advertisers, repressive governments, and other malicious players can attack the browser to identify its user and access valuable personal data without consent. Due to the breadth of the attack surface that the browser provides, there is little that the average users can do to defend themselves. If you are not identified and tracked by cookies, ad-malware, tracking-code, or browser fingerprinting, then caching and timing attacks are likely to get you in the end (Janc and Zalewski). One avenue that has shown promise in frustrating data collection in the browser, however, has been obfuscation. Obfuscation, defined as "[t]he production, inclusion, addition, or communication of misleading, ambiguous, or false data in an effort to evade, distract, or confuse data gatherers or diminish the reliability (and value) of data aggregations" (Brunton and Nissenbaum), has in part proven successful as a strategy due to the ubiquity of the browser itself. While a web service provider may be able to filter out unwanted requests from individuals, it is far more difficult when tens of thousands of different users are attempting to pollute their captured data in this way. As such, obfuscation may represent a useful avenue of resistance against contemporary datafication in online space.

While obfuscation has a long history in both the analog and digital realms, its direct application to online datafication (the quantification and subsequent monetization of human activity) dates back at least to the 2006 release of the *TrackMeNot* browser plugin.[1] The specific problem that this project addresses is the collection and aggregation of sensitive personal data during search. Implemented as a free plugin for Firefox and Chrome, *TrackMeNot* works by sending 'decoy' queries to popular search engines like Google, Bing, or Baidu, whenever a user searches, hiding their actual interests in a cloud of algorithmically-generated 'noise'. The tool is designed to increase the difficulty of aggregating such data into either accurate or identifying user profiles. Additionally *TrackMeNot* attempts to provide, "for some users a means of expression, akin to a political placard or a petition. For others it provides a practical means of resistance […] to large-scale systems of surveillance". The technology is described as a form of political action, building on work by Langdon Winner and Bruno Latour, who have argued that technical devices and systems may embody political and moral qualities.
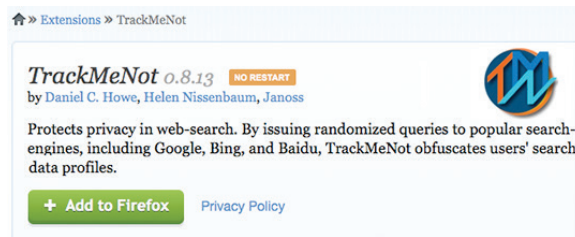
From these comments, we can see that while TrackMeNot is often grouped with other tools to protect 'privacy', there is a larger agenda at play, specifically an expressive

(a term we will return to below) resistance to quantification as means of managing human experience. Munster, in her description of what is at stake in the project, says the following:

> *Data mining is a technique that belongs to knowledge economies modulated by the diffuse politics of biopower… the historical shift, in western societies at least, from governing the individual to managing populations via techniques such as the statistical analysis and prediction of lifespan, habit, custom and so on (Foucault, Lazzarato). These techniques for managing populations now saturate 'life' and can be found everywhere [...] We cannot simply champion privacy and the individual against ubiquitous surveillance and the corporation. We need to look carefully at the technical forces at work in networks for they both modulate and generate power and potentialities.*

The artist Eduardo Navas may have recognized these larger dynamics at play when he selected *TrackMeNot* as the source for his own work *Traceblog*. Over the course of this five-year project, Navas ran *TrackMeNot* in his primary browser continuously from April 2008 to April 2013, and reposted each of *TrackMeNot*'s generated searches to the *Traceblog* blog (he does not post any of his actual searches). He writes:

> *[w]hat I find most interesting about* TrackMeNot *is that the pseudo search results are somewhat a reflection of what I do online. According to the developers of the Firefox extension,* TrackMeNot *keeps track of the actual searches and with time begins to assimilate parallel results that somehow*

reference indirectly what the user would search for […] It's like having my own double, a clone about whom I'm learning more and more about. I like this about TrackMeNot*, and it was actually the first thing that interested me about it […] For me* Traceblog *is another project in which I aim to explore the implications of the growing pervasiveness of information flow and its manipulation.*


Munster, in a review of the two works, makes explicit the link between this manipulation of information flow in the service of datafication and obfuscation as a counterstrategy, suggesting that we "not simply retreat or withdraw into the issue of privacy", but rather "become noisy, as noisy as our machines" (Munster).

Not all critics were as positive as Navas and Munster however. *TrackMeNot* also generated significant controversy, with one blogger referring to the prototype as the "Worst Security Tool Ever" (Hilton). Some critics questioned *TrackMeNot*'s effectiveness against machine-learning attacks, some cast it as a misuse of bandwidth, and others found it unethical. While these arguments were discussed in some detail in a paper describing the project (Howe and Nissenbaum), it is interesting to note the degree to which the project was initially derided by the security community, though the larger strategy, often referred to as 'privacy-via-obfuscation', has developed into an active subfield of computer science

research. Perhaps equally interesting are the obfuscation-based projects which may have been inspired by *TrackMeNot*.[2]

One such project, *I Like What I See*, by Steve Klise, is a web browser extension that automatically clicks *all* 'Like' links on Facebook. As with other successful works employing obfuscation as a strategy, the project can be described quite succinctly. On the project's Github page, Klise writes:

> *When you visit Facebook, click the thumbs up in the extension bar and start scrolling and liking. Liking and scrolling. Every instance of the word 'Like' will be clicked. Don't worry, Facebook is a fun place full of all of the stuff you like.*
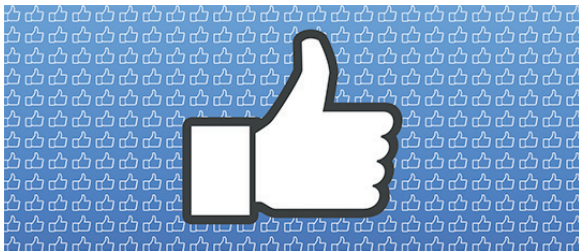
Liking 'everything' serves to obfuscate your true interests, in this case, from Facebook. However it is likely to also yield second-order effects, specifically the pollution of your social media streams with all manner of strange automated content; a phenomenon described in some depth by Honan.

ScareMail by Ben Grosser is another web browser extension that employs obfuscation in the context of email surveillance. Extending Google's Gmail, *ScareMail* adds to every new email's signature an algorithmically-generated narrative containing NSA search terms. This narrative acts as "a trap for NSA programs like PRISM and XKeyscore, forcing them to look at nonsense". Grosser describes the project as follows:

ScareMail *proposes to disrupt the NSA's surveillance efforts by making NSA search results useless. Searching is about finding the needles in haystacks. By filling all email with 'scary' words, ScareMail thwarts NSA search algorithms by overwhelming them with too many results. If every email contains the word 'plot', or 'facility', for example, then searching for those words becomes a fruitless exercise. A search that returns everything is a search that returns nothing of use.*
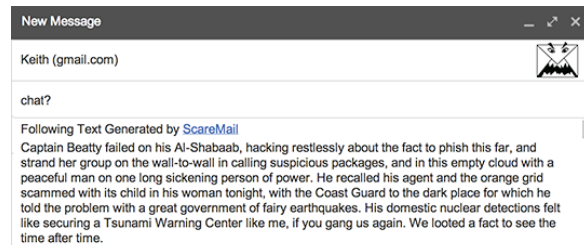
Closely following justifications for *TrackMeNot* (Howe and Nissenbaum), *ScareMail* proposes "a model of privacy built on visibility and noise as opposed to one built on encryption and silence" (Grosser).

AdNauseam, perhaps the most direct descendant of *TrackMeNot*, is a browser extension designed to obfuscate browsing data and protect users from surveillance and tracking by advertising networks. The plugin works with existing adblockers to block ads on visited pages, but then quietly clicks each ad in the background, polluting user profiles and creating mistrust between advertisers and the networks they pay for clicks. In addition to protecting users, *AdNauseam* attempts to amplify their discontent with advertising networks and shift the balance of power between the trackers and the tracked. One unique property of *AdNauseam* is its support for the notion of sousveillance,[3] via its 'AdVault' feature, which allows users to explore interactive visualizations of the ads they are served, providing an algorithmic

glimpse into their profile as perceived by the advertising networks (Howe et al.).


A number of relatively recent projects have extended obfuscation strategies beyond the browser and into the terrestrial world. *Facial Weaponization Suite*, by Zach Blas, attempts to intervene against biometric facial recognition by making 'collective masks' in community-based workshops that are modeled from the aggregated facial data of participants. These amorphous masks are not only aesthetically interesting, but apparently cannot be detected as human faces by biometric facial recognition technologies. One such mask, the *Fag Face Mask*, generated from the biometric facial data of queer men's faces, challenges scientific studies that link the determination of sexual orientation with facial recognition techniques. Another mask takes up biometrics' deployment as a border security technology and the resulting violence and nationalism it instigates. These masks intersect with social movements' use of masking as a tool for collective transformation that refuses dominant forms of representation.

Invisible, by Heather Dewey Hagborg, applies obfuscation to the context of genetic privacy in the physical world, erasing and obfuscating traces of your DNA to frustrate identification. The *Invisible* kit, available in a limited edition of 100 as a retail item from the New Museum store,[4] is a suite of two complementary products. The Erase™ spray deletes 99.5% of the DNA you leave in public, while the Replace™ spray cloaks the remaining .5% with DNA noise. In a recent email exchange, Hagborg states that "the idea of an obfuscation DNA spray was actually inspired in part by Nissenbaum's talk at PRISM break up last year" (Hagborg).
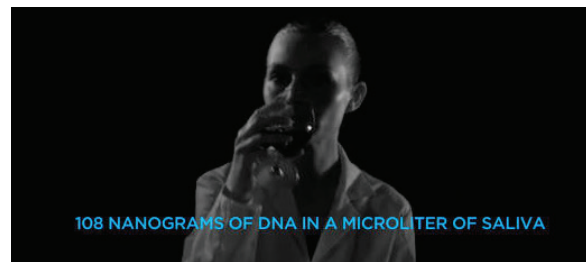
While the specifics of these projects vary, there are common elements we can identify. The first is that they all critically address the trend toward datafication made possible by algorithmic processing of data at *scale*. Scale is important in that it necessitates the use of machines for the collection and analysis of data, and, in most cases, removes human observations from the equation. Thus it is worth reiterating the point that obfuscation technologies generally target algorithmic systems (even in apparently non-digital cases like radar chaff or loyalty card-swapping[5]). In fact, as the types of noise introduced into these collection systems can often be identified by human analysis (consider *ScareMail*, where a human observer would quickly be able to recognize the type of 'noise' being generated), it is specifically the machinic nature of such systems that is targeted. For this reason, obfuscation can be situated within a larger class of strategies, as described by Gary Marx, whereby individuals attempt to resist surveillance by taking advantage of the blind spots inherent in

large-scale systems (Marx). Due to the scale of such systems, obfuscating technologies will generally rely on automation to achieve their ends; though this is not the instrumental automation that drives capital relentlessly onward, requiring still more automation at each subsequent step. Instead it is a tactical automation so limited in scope and context that its end goal is often to erase the need for itself. As the authors of *TrackMeNot* state, the goal of *TrackMeNot* is to, eventually, eliminate the need for *TrackMeNot*. Or, as Munster eloquently puts it, "to radically automate and to automate radically as a careful ethical and aesthetic gesture. The hope remains, even if this endeavour fails, of creating a more poetic pattern aimed at disaggregating behavior as a predictive and normative construction." (Munster)

This type of tactical, even 'poetic', resistance to automation at scale suggests the categorization of obfuscation-based tools as *expressive* technologies. That is, they exist not only to serve some instrumental function, but always also to amplify social, cultural or political perspectives. The expression that such tools facilitate is generally of a fundamentally different type than that which the technical system condones, though on the surface they may look similar. Take the example of web-search, in which users are expected to participate in the search system in exactly one way; that is by entering terms into the search box, and then clicking 'go'. Once these data bits have been transferred across the wire to the search 'engine', no further input from the user is allowed. The vast architectures of crawling, indexing, aggregating, and filtering — leading directly to surveillance — reside on the far side of this impermeable membrane, visible only through the tiny window that the search box represents. As this search box is the one permitted avenue of input into the system, it is the search-box that obfuscatory technologies

must rely upon. The constraints of the interface (and secondarily, the protocol employed) are necessarily ones that obfuscating technology must grapple with. *TrackMeNot* tackles such constraints directly, in effect saying, "indeed, we will use the search box you have mandated, but we will do so toward the realization of quite different ends than you intend". This re-assertion of agency in relation to both interface and protocol is a key locus through which obfuscating tools may realize their expressive power, amplifying the voices of those arguing for alternate criteria for value (privacy, autonomy, freedom, etc.) in technical systems.

Obfuscating systems also represent *communal* strategies, in contrast to more traditional security-oriented approaches focusing on protection of the individual. At a basic level, the tools discussed above can be understood to be communal simply to the degree that they are expressive; the amplification of non-dominant social voices can be conceived as communal practice in itself. Further, as Howe and Nissenbaum point out, some of these tools work communally in a stronger sense. The degree to which noise generated by obfuscation tools diminishes the value of the collected data in systems can serve to protect even those *not* using the tools. Even in cases where the removal of such noise is possible, one must consider the resources required to do so. Recent research on data mining show that the removal of noise from data-mining systems *already* occupies significant resources, with upwards of 80% of project time reported as being spent on the cleaning and preparation of data.[6] Thus even small amounts of additional noise added to systems may cause significant costs to data-mining service providers, and thus influence future decisions on what information to collect and store, and even, potentially, on whose views to consider when making such decisions.

So then, to what extent do the ob-fuscation tools mentioned share common goals? Though varying from work to work, one superset of goals that we might identify includes protection, expression, and sub-version (see figure 1). The first of these, *protection*, refers to the degree to which the tool attempts to protect individuals and communities from harms. We have explored the notion of *expression* above, referring to the degree to which the tool facilitates the amplification of user voices in the dynamic at hand. Lastly, *subversion* refers to the degree to which the tool attempts to undermine the larger system against which it is acting. So in the case of *AdNauseam*, the tool mani-fests three primary aims: a) to defend users against tracking by advertisers (protection); b) to provide users with a means of voicing their frustrations with the advertising system (expression); and c) to inject uncertainty into relations between ad-networks, advertisers, and websites, whose interests have, to this point, been largely aligned (subversion).
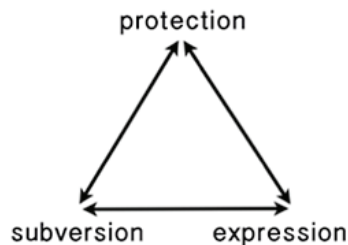

Figure 1: Obfuscation goals.

Each of these goals appears present to some degree in the systems described above, however their relative importance varies from tool to tool. In the historical case of radar chaff for example, protection (of attacking fighter planes from radar) appears tantamount, while expressive and subver-sive elements are relatively unimportant. For *ScareMail*, however, expressive and sub-versive elements are foregrounded, while

protection is relatively unimportant; the tool does not appear designed to actually protect users who are attempting to use NSA trigger words in their emails, but instead to express a larger critical point about surveillance, and to subvert the effectiveness of this type of bulk surveillance system.

There may also be relationships *be-tween* goals that are worth exploring. For ob-fuscation to function as protection, the noise generated by a system must exhibit a high degree of *indistinguishability* with regards to the data the system intends to capture. It must generally be *difficult* for an adversary to distinguish this noise from the data it is attempting to collect.[7] However if we imagine a tool that is perfect on the protec-tion dimension — one for which it is never possible to filter noise from data — then the system would be functionally invisible to the adversary. The expressive capabilities of such a perfectly invisible system, however, would likely be minimal, as the adversary is literally unaware of the injected noise.[8] Conversely, if a system is highly expres-sive, it may be easier for an adversary to filter the noise generated, thus diminishing the tools protective capabilities. In the case of *ScareMail*, for example, it would not be difficult for an engaged adversary to both detect users of the tool *and* to filter out the trigger-word-laden signatures generated by the system. However, in an odd twist, such filtering might also serve to create temporary spaces free of surveillance. If, for example, an adversary was filtering (and ignoring) data from the *ScareMail* signatures, this might create a free zone for messaging not subject to trigger-word monitoring. A similar situation might occur in the case of *AdNauseam*. Were an ad-network to decide to filter all clicks by users of the tool, such users would then be in the interesting position of being ignored by the advertising systems to which they are objecting.

So while there appears to be at least a somewhat inverse relationship between goals of expression and protection, there are interesting counter-examples to consider. For example, we might imagine a tool that is easily *detectable*, but which generates data that is highly *indistinguishable*. *TrackMeNot* itself is an example of a detectable tool, in that it is trivial for a search engine to notice the increased frequency of queries for users who install it. However this does not imply that the search engine can easily filter the noise generated by such a tool (see Gervais et al. for an analysis of this question for the case of *TrackMeNot*). An adversary may be aware that a tool is injecting noise into its system, yet be technically, culturally, or otherwise unable or unwilling to filter it. In such a case, we might imagine the tool to be successfully protecting the user *and* facilitating a high degree of expressivity. Whether such a tool does (or can) exist in practice is another question.

To conclude, one term that may be useful in conceptualizing projects that leverage obfuscation as a means of critiquing datafication is the notion of 'data undermining' (Munster). To data undermine, according to Munster, is not only to leverage the same data and network structures responsible for datafication as a means of investigating and critiquing it, but to do so via *aesthetic* strategies. Such strategies, which she describes as an "aesthetico-political set of practices and directions for contemporary networked culture", relate not to *how* such work looks, but rather to *what* it allows us to see — specifically the data, algorithms, and relations that capital networks obscure. This verb, 'to obscure', from the latin *fuscare* ('to darken') is of course one of the roots of obfuscation (together with *ob-* 'over or against'), an interesting counterpoint with the aesthetic strategy of making visible. Munster says,

The poetics of data undermining as a networked art approach lie in how extensions, aggregators and plugins use display as a mode of intervention into the spaces of existing web design. There is a poetics in the creation of networked spaces in which alternative forms of sociality might be invented and which cut across predesignated arenas for online interaction.

It is perhaps this very revealing of hidden mechanics, what Munster describes as the attempt to "poetically render perceptible the interests at stake", that makes possible the imagination of the alternative social forms suggested by the projects above.

Notes

[1] *TrackMeNot* (http://cs.nyu.edu/track-menot) is a project by the author and Helen Nissenbaum. Earlier examples do appear in the literature, especially for location-based privacy (see Duckham and Kulik), however such systems generally focused on the restriction of information released, rather than on the addition of noise.

[2] Several such projects have been described by Brunton and Nissenbaum, including *FaceCloak* (Luo, et al.), *BitTorrent Hydra* (Schulze and Mochalski), and *CacheCloak* (Meyerowitz and Choudhury). There have also been a number of subsequent obfuscation schemes for the search case, five of which are detailed, and compared to *TrackMeNot* in Balsa et al.

[3] 'Sousveillance' is a term coined by wearable-computing pioneer Steve Mann to describe inverse surveillance. The term comes from the French 'sous' (from below) and 'viller' (to watch); to watch from below. Mann suggests that societies may employ sousveillance "as a way to balance the increasing (and increasingly one-sided) surveillance".

[4] See http://www.newmuseumstore.org/browse.cfm/invisible/4,6471.html.

[5] Radar chaff and loyalty card-swapping are two cases of early obfuscation strategies described in Brunton and Nissenbaum.

[6] One data analyst states "going back to the key question of this article: what fraction of time is spent in data preparation for modeling? […] I have continued to ask this question of any group of analysts I happen to meet, and the answers have been remarkably consistent: the most common response is 80%. Literally hundreds of practicing data miners and statistical modelers, most of them working at major corporations supporting extensive analytical projects, have reported that they spend 80% of their effort in manipulating the data so that they can analyze it" (Steinberg).

[7] Computer science researchers have advanced interesting definitions of how this difficulty can be measured. See Balsa et al. and Gervais et al. for two such approaches (both of which include *TrackMeNot* in their analysis.)

[8] One additional question might involve the specifics of the definition of '*expressivity*' being applied. In the case above we appear to require an adversary to be aware of a system for it be considered expressive. Yet this does seem a necessary component of the definition. One can, for example, imagine a system that has no measurable effect on an adversary, but still allows users to feel that they are acting expressively nonetheless. The adversary simply does not hear the user's expressive voice. Whether such expression is 'real', much like the question of whether a painting that no one views can still be considered art, is beyond our scope, however it is interesting to note that such a system might be considered ideal from the perspective of the adversary; a system that *appears* to afford users with greater voice, but actually has little real-world effect. Examples here might include the case of online petitions, or the current DoNotTrack standard, both of which likely have little instrumental effect, but may create a sense of expression in the user. In a pessimistic analysis, such potentially 'inauthentic' expression could work to diminish the likelihood of individuals taking other, possibly more effective, actions.

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