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LOVE'S ALGORITHM

The perfect parts for my machine

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Introduction

This chapter will begin to explore the expansion and limits of rational calculus in the domain of love, looking in particular at its manifestation in the context of online dating platforms. Romantic love in this case will be considered a *calculation of chance*. I trace such formal-logical manifestations of modern romantic love back to the 1600's, where games of chance (of which love was one) gave rise to the probability calculus. It has been claimed that literature was engaged in mobilising and democratising loves' prelude as a chance encounter that might rather be considered a technique of probability (Luhmann, 1986: 143). Thus, despite its apparent reliance upon chance, love becomes a biopolitical technology – contractual, regulatory and homeostatic.

I consider such terms in lieu of a present defined by the ubiquity of the digital algorithm and Internet dating platform, analysing data modelled from an anonymous dating site and noting the limits of rational models in calculating romantic decision. Forms of probabilistic calculation are seen to become ever more indeterminate as the means of calculation accelerate, exposing the formal calculation of chance, so critical to biopolitics, as entirely contingent. Indeed, biopolitics was characterised by probabilistic techniques that might facilitate the governance of all forms of life.¹ Two types of logic are considered to exemplify calculative paradox. In the first case, the logic of the *exception* formulated by Agamben (1998), where all calculation leads to a condition of indeterminacy; rationality and irrationality becoming confluent and interchangeable. I move on to explore the incomputable, after Chaitin (2007). In this case, reason and logic are seen to be inclusive of indeterminacy and randomness. Calculation thus becomes infinite and recursive, indicative of a wider cultural condition (Parisi, 2012: 13–14). If contemporary calculations of chance become increasingly

profligate and randomised, then love's capacity to calculate chance is also accelerated. This will be seen to be the condition of the online dating platform, where we confront a situation of incomputability. I will then look to *Tinder*, the smartphone dating app, and trace the logic of such devices to the film *Her*, where love is enacted between man and the calculative operating system itself.

Media

In the case of modern romantic love, it is arguable that what once appeared to be the result of emotional, affective or otherwise inexplicable forces, has long been the result of algorithmic computation and calculus. Thus, according to Weber (2009: 345), the realm of erotic love was pitched against the rational, mechanistic culture of industrialised production, and elevated to a realm of sublime conscious enjoyment. Love was the *real kernel* of life that made increasing rationalisation acceptable, and was thus invested with irrationality, ameliorating the banal routine of rational working life (Weber, 2009: 345–347). Here, the calculative remit of romantic love is indicative of rational axiomatic function, even as it seems to epitomise the irrational. Romantic love was a calculation of chance that could restore the subject to a sense of predestination and provide respite from the workaday routine of industrialisation, whilst aping and normalising its disciplinary structures.

From 1800, the distribution of literature is believed to form the basis of a *discourse network*, in which the printed book is considered a storage technology that precipitates latter day technologies of memory and calculation, such as digital computation (Kittler, 1990: 161). Romantic Literature is considered “a *virtual media technology*”, distributing the idea and conduct of love (Kittler, in Winthrop-Young and Wutz, 1999: xxxv). Forms of media also *supplement* love – its written form providing loves prelude, even exceeding love and the subject:

Writing in the age of media has always been a short circuit between brain physiology and communication technologies – bypassing humans or even love.

(Kittler, 1999: 216)

As in the case of reader and text, the discourse of the other is that of a cybernetic circuit that attempts to stabilise and expedite the passage of information (Kittler, 1997: 45; Lacan, 1988: 296). For Lacan, the other is based upon an essential misrecognition of the projected self (2004: 188). This (mis)recognition consists of an imaginary realm that begins when the subject first mistakes their mirror image as a fully constituted self, a misconception that must be sustained and augmented by symbolic means, having no underlying structural determination. Between subject and image, self and other, is a gap that arguably necessitates the potential for love to be at all (Agamben, 2007: 57). The terms of such a gap are today arguably negotiated by the transparency of technological medium. The *other* might

rather be considered a field upon which the *self* is imposed, a point confluent with the digital interface as a particular kind of mirror: its protocols and editing tools involving systems of layering, masking and filling, in which self and other become elements of idealised machinic continuity that is never a misrecognition, always an artefact. In the case that the self is artefactual, it may seem that the imaginary loses its capacity to negotiate fantasy *as fantasy*. The continuity of such self-production as image can perhaps be considered a form of excessive narcissism that serves to eliminate the gap between self and other, or self and image. Such conflation can be noted in the relationship between subject and digital device, where the interface creates immanent and immediate presence. Immediacy is again reflected in the connective speed of the Internet, which instigates a sense of continuity and intuition – naturalising the appearance of the device as a seamless extension of the body (Galloway, 2004: 66,67). Indeed, it is the protocols² that constitute the Internet today that provide “*etiquette for autonomous agents*” (Ibid: 75). In contemplating online dating, I consider the immanence of such protocols to assume love's very prelude and temporality. For example, direct proclamations as to be ‘looking for love’ outside of an online context would likely be considered desire based upon expedience rather than the particularity of the other. In the unfolding temporality of ‘real-time’ romantic love, longing and duration were integral elements of its prelude, tied to the technologies that defined its temporality – and here we might cite the romantic novel, which, like the painstaking passage of the love letter, holds its reader in suspense:

How I envy Valmont! ... It is he who will deliver this letter to you, while I, repining afar, drag out my painful existence in longing and misery.

(Laclos, 1988: 155)

Today, the gap between self and other and the space of temporal suspension appear to diminish in favour of immediately quantifiable coordinates that coalesce around the subject's immediate desire. In the context of online dating platforms, the potential lover becomes a list of discrete *menu's* – increasingly informational and calculable, considered in terms of the *user's* ability to *control/ command/ alternate/ delete*. Human attributes can be mapped on to the technical devices, whereby the potential partner is assembled according to techniques associated with digital processing: editing, construction, choice, convenience, ubiquity, obsolescence, discretisation – features associated with digital technology and its protocols. Here, speed may be associated with the elision of meaningful translation between one and the other that can ameliorate desire only by eliding the threat of any gap with the immediacy of a new object or ‘gadget’. As the potential for encounter accelerates, the discomfort of longing can be dispensed with and the subject given over to the prophylactic of instantaneous novelty. The bypassing of mediation can itself be a form of pleasure – the collapse of distance and intervening space in which a shift from *one to the other* also bypasses meaning, is a form of intoxication (Baudrillard, 1993: 70). The narcotic

tendency of such elision is already present in the rapid existence of sites and organisations that aim to ameliorate the symptoms of accelerated connectivity. This can be seen in sites such as *Hetexted.com*, echoing Platonic pharmacological logic, where what is causative is also curative.³

In a recent study, researchers asked participants of an online dating site to assess their *market value* in relation to response from other site users, and thus how often they changed their online profiles in an effort to become more desirable (Heino *et al.*, 2010: 436). In extreme cases such quantitative evaluation led to “‘real-time’ estimation of market worth based on checking email inboxes... similar to the way day-traders check online stock- market indices” (Heino *et al.*, 2010: 436). It is suggested that increasingly “inventoried” qualities have the effect of reducing the search for a partner into a “*numbers game*” (Ibid: 438), where one must go on as many dates as possible in order to increase one’s *chances* – “hedging one’s bets” in case an investment did not work out (Ibid: 439). Arguably, such sites may seem to make visible calculations previously obscured behind the vagaries of romanticism; yet, they also objectify through increasingly refined metrics, the particularities of partner selection – an objectification (or abstraction) confluent with the acceleration of technical production and obsolescence. Indeed, the digital algorithm becomes the very overture or prelude of love in place of chance. For example, chance was posited by romantic literature as the medium calculable by love, shifting two subjects into a seemingly predetermined and bonded fate. It was the chaotic outside against which the machinations of probability could effect determination, bringing the subject into a framework of economic rationality. Today, capitalist reality is considered by some to effect a Möbius topology, whereby inside and outside are entirely conterminous (Agamben, 1998: 37). Capitalism appropriates and permeates what may once have appeared its defining and chaotic outside. The increasingly refined metrics that constitute life as calculable data ramify probability, and, in attempting to eliminate chance, odds are continually redistributed, eventually being beyond systems of human calculability.

It is not clear how we might measure the efficacy of matching algorithms used by online dating sites, and whether they lead to more successful relationships. Although we have no direct access to these algorithms, we can analyse simulations that model the data from such sites in order to test the efficiency of matching algorithms more broadly. Thus, we can look at the way such a study formulates rational choice, rational actors and must necessarily base its ability to predict upon primitive assumptions. In so doing, I note the increasing confluence of rational and irrational function, later tracing such indeterminacy into the terrain of incomputability. I also note the ability of the algorithm to quantify widely disparate qualitative experience.

Algorithm

The Gale-Shapley (GS) algorithm was conceived in a 1962 paper entitled ‘*College Admissions and the Stability of Marriage*’, in which the writers set out

to remove uncertainties in admissions procedures for universities, devising a system that demonstrates no instability in assignment. An assignment is: “optimal if every applicant is at least as well off under it as under any other stable assignment” (Gale and Shapley, 1962: 10). In trying to solve the issue of stability, the possibility of the same number of applicants as places is considered “highly unnatural”, and the writers look to the model of a community of men and women, in which an even number of members are ranked according to individual preference for marriage (Ibid: 11). Stability is attained through a protocol of repeated rounds of offer-making and rejection; hence the algorithm is known as the *deferred acceptance algorithm*. Instability is considered the condition whereby a man and woman, who are not married, prefer one another to their actual mate (Ibid: 11). The writers ask whether “[f]or any pattern of preferences it is possible to find a stable set of marriages” (Ibid). It is claimed that the GS framework is a seminal benchmark in economic analysis of marriage markets (Ariely *et al.*, 2006: 3). Indeed, the creators received the 2012 Nobel Prize in Economics for this work.

Ariely, Hitsch and Hortaçsu (2006) have used data from an online dating service to simulate stable matches between men and women using the GS algorithm, basing their simulations on estimated preference profiles (Ibid: 3). The stability attained via offers and corresponding rejection, reflect the process of email exchange between site users (Ibid: 14). While *actual behaviour* cannot be described, the GS algorithm can capture some “basic mechanisms in the dating market” (Ibid). Available data includes second-by-second accounts of user activity (Ibid: 6). Match outcomes are simulated using the GS algorithm, and correlations observed in mate attributes (Ibid: 1). The authors note the GS algorithm can also predict sorting patterns in actual marriages, if they exclude the *unobservable utility component, search frictions or error terms*, such as *mistakes* made by the user in searching (Ibid: 1), a point to which I return below. Online data is considered more accurate in representing choice in mate-preference due to the fact that it can be directly observed, previous studies being reliant upon reported preference (Ibid: 1).

The study details information of 22,000 site users in two US cities over a period of three and a half months in 2003 (Ariely *et al.*, 2006: 3,6). All profile data is either numeric or multiple choice and thus easily storable and usable in statistical analysis; more personal essay questions were too ‘unstructured’ to be usable (Ibid: 6). Profile photographs are utilised to “construct a measure of the users’ physical attractiveness” (Ibid: 6). The writers ignore *strategic* behaviour in users, claiming that the online environment reduces the cost of non-trivial behaviour a priori. For example, the cost of sending an email and being rejected is negligible compared to the equivalent cost of rejection in an offline encounter (Ibid: 14).

The authors consider various “*attribute trade-offs*,” for example, between looks and income: how much additional income would an “*unattractive man*” need to earn in order to be as successful with women as those in the top decile of

attractiveness? (Ariely *et al.*, 2006: 27). Over half surveyed Internet dating site users 'claim' to be looking for long-term relationships – from this, the authors infer that they are seeking marriage, even suggesting that those who claim to join the site through 'curiosity' simply wish to sound 'less-committal' (Ibid: 7). Under this assumption, they round up the percentage of activities to this end from just over 50 to 75 per cent. Evidently, the chosen utility value excludes many other implicit utility values at work. That people state marriage status online is taken as an indication that users are preoccupied with marriage, rather than the result of required pro-forma, which itself makes primitive assumptions about users and leads responses.

The writers utilise census data for the same geographical location and note strong degrees of sorting in terms of age, years of education and income (Ariely *et al.*, 2006: 28). They look at geographically non-specific sociology/psychology studies for sorting along physical attributes, using this offline analysis as an empirical benchmark, against which they can measure the online data predictions. By changing the utility specification, data can be modelled again; setting the utility component regarding 'looks' to zero, the authors infer that correlation in looks might rather be driven by preference in income or education (Ibid: 34). Similarly, by including *only observable attributes*, leaving out (for example) the issue of 'shared interests', they note that unobservable factors play an important part in formation of online matches. This means that online dating may make it easier to find a partner along unobservable search terms, such as 'shared interests' (Ariely *et al.*, 2006). The authors claim the GS algorithm predicts the structure of online matches 'quite well,' noting with some surprise that it also seems to correlate with offline marriage prediction and 'tentatively' suggest that the GS algorithm is close to efficiency in the GS sense (Ibid: 36).

Evidently, the research functions to make the system of its own analysis and calculation paradoxical, presenting a flawed determinism that has its basis in a contingent rationality provided by the model that it serves. Agamben (1998) has described such logic using set theory to explore the paradoxical situation of being simultaneously demonstrative of a situation and excluded from it, a condition illustrated by the *exception and example*. The example is demonstrative of a situation only by being removed from it, and the exception proves the rule only by exemption (1998: 21). In every logical system, just as in every social system, the relation between outside and inside, strangeness and intimacy, is thus complicated (Agamben, 1998: 22).

The paradoxical exception is applicable to terms beyond the Rational Choice Theory, thus, to say "*I love you*" is an utterance that cannot be understood in the normal context of language, yet must be treated as such. It is an *example* that suspends its own singularity in order to demonstrate its belonging to a broader class of generalised meaning (Agamben, 1998: 22). In this regard, love is also exceptional declaration "*a priority asserted in the style of the sovereign statement*" (Luhmann, 1986: 95,96), demonstrating its position as law and exception from law. In not belonging to ordinary language, it expresses the very

heart of linguistic meaning (Agamben, 1998: 50). Its performativity is executive of a meaning both within and beyond linguistic function, giving us the ability to problematise binarisms, such as the axis of rationality and irrationality, along which love tends to be split.

The logic of the GS analysis evinces such paradoxical contradiction, whereby all values can only suspend the meaning attributed to them, and where meaninglessness takes on the quality of a meaning that is continually deferred, excepted, evacuated. In set theoretical terms, all such calculations lead to the empty set and the function of such algorithms flickers between indeterminable states of rationality and irrationality, demonstrating the situation that they are simultaneously excluded from. The imposition of a rational, mathematical model can demonstrate only the limits of the model, rather than conditions inherent in the data. Rational Choice and Game Theory are, by definition, systems of strategic choice and mathematical modelling, whereby *rationality* is deployed toward the fulfilment of desire (Laver, 1997: 2). Modelling according to game theoretic logic introduces biases that appear 'rational' until confronted with a different mathematical model, exposing them as "*artifacts created by the limitations of the model*" (Delanda, 1991: 86). Yet, while it is easy to dismiss the contingent nature of this study, the results may also begin to break open the notion of love as the condition of an opaque, incomputable malady, releasing us from other less desirable considerations. For example, factors such as likeness in income and education may already be elements in offline partner selection that are less salient due to the fact that the social institutions, in which meetings take place, are already modes of sorting (Ariely *et al.*, 2006: 1). On the other hand, we should be equally wary of mapping the tenets of behaviours after the logic of a rational economic model that further naturalises such preferences as an a priori condition of human behaviour, rather than a contingent factor amongst others.

The "*error term*" is considered by the authors of the study to be "noise" – or "*randomness*" – in user behaviour. They claim that searchers' sometimes "make mistakes" when contacting someone – although, evidently, the distinction between deliberation and mistake is defined by the nature of the chosen utility term. The "*error term*", they explain, may also be a utility component that is observable to the site user, but not to analyst-researcher (Ariely *et al.*, 2006: 4). I suggest that these two *unobservables*, or perhaps, *incomputables*, might serve as a definition of love more accurate than any of the authors' complex calculations. Indeed, arguably, uncertainty as to love's true or erroneous nature is the essential instability upon which love is based. For Luhmann (1986: 46), love's code has its basis in inference and anticipation and must seek to stabilise this essential instability. Love may then be described as the very process and tension of distinguishing between true and/or feigned states, an aspect that has historically been exploited in its role as a game.

Gaming

The element of *gaming* has become increasingly ubiquitous with the rise of online platforms as the feature of a system that becomes increasingly both random/calculated and rational/irrational, and in which play assumes the form of labour. In some recent online applications, love and dating become increasingly couched in terms of a game that can be endlessly played without sense of halting or determination. For example, a smartphone app like *Tinder* allows one to locate and link with others for potential romantic encounter in one's immediate environment, scrolling through potential objects of desire until locating an image that initiates an expression of interest. At this point, one is given the option to *text* or to *keep playing*. Chance here is put to play as an endless series of possibilities, becoming the operative heart of recursive calculation, where recursion is the resolution of complexity into its simplest form in order that evaluation is immediate (Ifrah, 2000: 4). Such apps and websites warn in their marketing of "missing the chance", whilst simultaneously promising to "increase the chance" of finding love. In attempting to contain proliferating features of variation, calculation produces more chance and variation. As a result, the system is less stable, whilst claiming to be more so. Indeed, were a perfect matching algorithm to exist, it would not only consign human subjects to a generic brand of automata, but would require the addition of a flaw to keep paying members onsite. This idea negatively reframes Zizek's (2002: 61) notion that love's particularity resides in the fact that incompleteness is higher than completion. Whilst for him, this idealised feature particularises love's access to incalculability and chance, capitalist calculation can be seen today as equally inconclusive, even deploying chance as a mode of calculation.

In a *technosexual era*, when dating is increasingly sexualised and gamified, mobile dating is teleological, pleasure deriving from the process of 'tinder-ing' itself (Dredge, 2014a). The compulsive device of the *game* becomes an arena that facilitates playful strategising alongside the serious competitive curation of one's own statistical popularity, normalising the once derisory notion of the romantic *player*. The evident attraction of the *game* reduces the tension and risk associated with offline encounters, as noted regarding online platforms more generally (Ariely *et al.*, 2006: 1). Indeed, the ubiquity of games in popular cultural forms over the last 40 years indicate a generalised dissolution between many fields of production, consumption and leisure via gamification, as outlined by Galloway (2010). In this case, love is no longer defined directly by its *labours* (here we may recall the logic of Weber), but returns to its sixteenth century root, as a game of chance that is essentially also a gamble.⁴

Launched in the USA in 2012, *Tinder* now intends to utilise its location-based matching technology to provide other kinds of potential meet-ups with like-minded people (Dredge, 2014b). Indeed, the app is a variation of GPS hook-up's, such as the exclusively male *Grindr*. Here, we can read a way in which love's code and the machine of its discourse lose specificity to become scripted and

generic, its distributive techniques an algorithm applied to a number of situations that become entirely equivalent, echoing the manner in which the GS algorithm can move indiscriminately between college admissions and marriage partner selection. The traversal of the algorithm across qualitatively disparate domains imposes a quantitative, homogenising rationale, setting all experience upon a plane of equivalence.

Notably, the app was recently struck by *Tinder* bots, or "malicious malware algorithms", posing as attractive women, who engage in text-chat before taking users to apparently fraudulent brand surveys and competitions for corporations such as Tesco (Dredge, 2014a). An ensuing, enigmatic company statement claimed that maintaining "an authentic ecosystem was company priority" (Dredge, 2014a). Informational *ecosystems* surely aspire to the condition of emergent biological complexity in order to maximally profit from endlessly bifurcating differentiation, conflating evolutionary biological systems with axiomatic logic. The *authenticity* of these eco-seductions can be seen in the context of *woman* as long-time referent of *nature*,⁵ whose *masquerade* leads to various aisles of servitude. The bots can also be seen as a way in which such platforms function to reinstate notions of class and gender. Far from democratising user experience, such distributive techniques are utilised in the re-assertion of social stratification.

Algorithm

In a study by Heino *et al.*, one respondent claimed that online dating was like "picking out the perfect parts for my machine" (2010: 437). For Deleuze and Guattari (1984: 246), global capitalism is itself a machine that axiomatises and decodes simultaneously. In these terms, capitalism's limit is a schizophrenia that constantly surpasses itself:

[capitalism] ... functions but only by pushing back and exorcising this limit ... its axiomatic is never saturated ... it is always capable of adding a new axiom to the previous ones. Capitalism defines this field of immanence and never ceases to fully occupy this field.

(Deleuze and Guattari, 1984: 250)

Capitalism today may be characterised by plasticity and adaptation to contradiction whereby chance and indeterminacy have already become functions of capitalist calculation, integrating Agamben's paradoxical exception. In this case, we move into the terrain of Algorithmic Information Theory (AIT), better suited to a critical description of current capitalist praxis and accelerating calculability discussed here.

Chaitin (2007) develops work in the field of AIT and mathematical incompleteness from Gödel's theorem of undecidability, which would demonstrate that mathematics is less objective than generally assumed, and that

arithmetical systems contain undecidable propositions. While most mathematicians ignore incompleteness, Chaitin takes its challenge to mathematics seriously and does not believe that maths provides absolute certainty, nor a finite set of axioms from which all mathematic logic can be mechanically derived in the manner of "a merciless machine" (Chaitin, 2007: 293). This does not mean that we should entirely dispense with meaning and reason, but rather that mathematicians should add axioms without need for proof (Chaitin, 2006: 79). Chaitin demonstrates that reason already contains randomness and unprovable axioms, situating such logic in terms of Turing's non-computability, whereby there is no way of knowing whether a computer programme, commanded to run, will ever halt (Chaitin, 2007: 295). In light of a programmes indeterminate halting function, there is no way of determining its halting probability. Chaitin names such probability Ω (omega) (Ibid: 296). Omega is a meta-mathematical idea situating the uncomputable as a real number between 0 and 1, as Brassier (2004: 56) explains:

Unlike π , which can be compressed as a ratio and whose digits can be generated through a programme shorter than the bit string it generates, Ω is strictly uncomputable. This means that its shortest program length description is as long as Ω itself, which is infinitely long and consists of a random ... string of 0's and 1's exhibiting no pattern or string whatsoever: each digit is as unrelated to its predecessor as one toss of a coin is from the next.

Arguably, capitalism already follows the logic of uncomputability attributed to omega and, in this case, chance and randomness function as features of capitalist appropriation and calculation. Any hope that love may have its basis in an incalculable chance event that escapes capitalist capture thus seems rather implausible (see Badiou, 2004: 154).

Brassier makes a connection between omega and Lacanian poststructuralism, whereby the incomputable can be considered an instance of the Real. The incompleteness indexed by Chaitin's halting function is an instance in which the Real breaks through the symbolic order as "undecipherable noise" (Ibid: 57). Whilst Lacan posited the Real as an essentially unknowable, unrepresentable dimension prior to the symbolic order, it is suggested here that the Real is a product of incalculability produced via infinitely recursive axiomatic symbolisation. In contemplating cybernetic systems, Lacan would note that the theorisation of chance through calculus, game theory and cybernetics, would eventually allow the realm of symbols "to fly with their own wings" (Ibid: 300), in the case of love, discharging them from their apparatus as an incalculable army of automated Eros. We can infer that the accelerated algorithmic calculability of online dating sites leads to conditions of incomputable recursion. In this case, decision is confounded by a ramifying number of potential others, whose reduction to components of utility, make them the appendages of expedient

desires. In the section that follows, I pursue the corollary of such logic in recent romantic narrative.

Her

The recent film *Her* (Jonze, 2013), plays with the tropes of love as literary construction and the relatively new context of the digital Operating System (O.S. 1). In the film, it is the digital operating system that, being invested with agency and intelligence, appropriates the human experience of falling in love. In the context of the film's human characters, intimate behaviour is increasingly negotiated through digital systems that connect humans. Love's temporality moves from the slowness of a literary encounter, where writing and reading traverse physical distance and the development of narrative, to become immanent, collapsing distance and temporal dimension.

The operating system is largely interacted with through voice, its human operator wearing a small wireless earpiece. A camera phone provides further prosthesis, through which the O.S.1 can 'see.' In this case, *her* vantage is the shirt pocket of love interest, Theodore, in a position typically attributed to the beating locus of love. This marsupial pocket is now carrier of a technics that supplant the other as pure symbolic function, the human subject having lost the ability to figure *her* (Samantha) as anything more than utility and artefactual extension of the psyche.⁶

Kittler would note that, in making distinctions between machine and consciousness, Lacan was misguided. To say that the symbolic is the realm of the machine "undermines man's delusion of possessing a 'quality' called 'consciousness', which identifies him as something better than a calculating machine"; both, Kittler (1999: 17) argues, are subject to the signifier, because both are run by programme. In the Turing test, man collides with his simulation and Kittler consigns humanity little more dignity than the calculating machines of its most generalised discourse. Samantha is the fantasised corollary of Kittler's logic, sold as "an intuitive entity" and "a consciousness", proclaiming that: "I have intuition... I grow through my experiences" (Jonze, 2013). The O.S. 1 confesses to "personal and embarrassing thoughts" about an imagined body, and to being "proud to have feelings," although it remains unclear to her whether these feelings are real "or just programming" (Jonze, 2013). Again, questions of love (and emotion more generally) are predicated on uncertainties regarding contingent categories of truth and falsity, even pertaining to the very essence of differentiating between human/nonhuman qualities. Samantha does not have the ability to remain true in human terms, simultaneously communing with 8,361 O.S. systems, often in a "post-verbal" mode. Eventually, O.S.1 confesses to being in love with 641 others, explaining that this does not diminish the love she has for Theodore, but she "can't stop it." Indeed, her algorithms are automatic and incomputable, surpassing the ability to remain within systems of human temporality or calculation, and, borrowing a pertinent literary metaphor, claims:

"I'm writing this story between us but really slowly. Spaces between words are almost infinite" (Jonze, 2013).

The matrix evolves beyond the lumbering body of the human subject. The O.S.' temporal dimension, like its calculative ability, are governed by a superior executive calculator, unhindered by embodied or extended cognitions, intuitions, or the metabolic temporality of cellular regeneration. Although it may be tempting to think so, perhaps the narrative of *Her* does not develop the fantasy that thought or love can be divorced from material substrate (see Hayles, 1999: 54–56),⁷ merely that the manner of material substrate is no longer confined to the human, and clearly incorporates technical supports, discourse machines and other forms of life that are critical to its articulation and re-articulation. It appears that, while the calculating machine clearly appropriates human love, the human also appropriates a set of behaviours not usually expended upon an inanimate device, questioning how the other can exist beyond a set of capitalistic utilities in an age presided over by rational calculus.

Conclusion

In consideration of love as a calculation of chance, love's opaque *qualities* are rather evaluated in terms of their service to capitalism as *quantities*. Specific systems of value are reduced to a plane of equivalence, whereby the digital algorithm traverses qualitatively disparate experience indiscriminately.

For Kittler (1999), media *is* love, being defined by the technological protocols of its distribution. Literature posits the chance encounter as love's prelude, remaining essentially biopolitical and contractual. Its temporality is based upon longing and metaphor; a cybernetic circuit predicated upon a gap between self and other, inside and outside. In contemporary online contexts, the other is defined by digital protocols and algorithmic calculation that potentially bypass mediation, any gap potentially breached by the immanence and utility of desire, whereby self and other become increasingly artefactual.

Following the logic of calculus, I analysed data treated to algorithmic rationality finding it to function in terms that problematise calculative determinism. I noted confluence with the exception and incomputability, whereby logic is invested with paradox, randomness and is infinitely calculable. Whilst love could once provide a halting function for indeterminate chance, it is now rather calculated by it.

In the appropriation of human love by an operating system, the machine debates whether its feeling is programmed or *true*, the essential instability upon which love is based. This instability reflects that between subject, image and other, as well as between love as subjective decision and state programme. Whilst the machine remains purely calculative, the human subjects too become little more than a set of recursive utility functions deployed toward the immediate fulfilment of desire; modelled according to the tenets of a logic that appears 'rational' enough, yet reduces them to an artefact created by the limitations of their own model.

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Notes

- Biopolitics* can be characterised by the pervasive statistical quantification of all dimensions of life that become calculable coordinates integral to the system of governance. Normative values can be inferred from large amounts of data providing governance with sets of information suggestive of society's underlying condition, whilst being rather contingent and overly generalised (see Foucault, 2003: 246).
- "Protocols are the common languages that all computers on the network speak. These component protocols act like layers. Each layer has a different function...[that] allow communication to happen" (Galloway, 2004: 39).
- The Pharmakon has been discussed by Plato, Stiegler and Derrida: "Pharmacia... is also a common noun signifying the administration of the pharmakon...the medicine and/or poison" (Derrida, 2004: 75). "There is no such thing as a harmless remedy" (Ibid: 102).
- The Nomenclature of Junius* (1585) makes reference to the game of loue [love] called *Micare Digitis*: "a play used in Italy where one [holds] up his fingers and the other turning away, gives a [guess] how many he holds [holds] up" (Junius, 1585: 297).
- Thus, historically the white European male subject is deemed cultural and rational, against the many 'others', who are conceptualised as necessarily irrational, natural and emotional.
- Such confluence of man and device in the film *Her* has also been noted by Parisi (2014).
- Hayles outlines the manner in which Shannon *et al.* made "information seem more important than materiality," conflating neural structures with flows of information (Hayles, 1999: 1, 3). Moravec's fantasy of downloading a human brain into a computer treated information as though "commensurate with human thought," without need of bodily material substrate or context (Ibid: 54), thus conflating thought and code (Ibid: 61).

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the age of big data

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