



Matteo Pasquinelli

**The Eye of the Algorithm:
Cognitive Anthropocene
and the Making
of the World Brain**

Fall Semester

The Eye of the Algorithm: Cognitive Anthropocene and the Making of the World Brain

Matteo Pasquinelli

Provided that it is possible to explain... the functioning of a circuit of cortical neurons using the functioning of an electronic analyzer in transistor form as a model, it is tempting... to attribute... the less intellectual functions for which the human brain is the organ to the computers in the technico-economic organizations they serve.
— Georges Canguilhem, *The Normal and the Pathological*, 1966.

The governance of the world brain

The idea of collective mind is as old as the most ancient forms of spirituality and political philosophy — before Asimov, in 1982, finally decided to send it to govern planet Gaia.¹ The concept of ‘cognitive capitalism’ is evolving too, in face of the new machines of augmented intelligence and the new cults of Artificial Intelligence. This concept was useful to push a *cognitive turn* within political economy around 2000, when postmodern philosophy was still attracted by and discovering the linguistic turn of knowledge society.² Today the magnitude of computation,

digitalisation and networking seems to accelerate well beyond the scale of linguistic labour. “Artificial intelligence will be more dangerous than nuclear power”, reported mainstream headlines in August 2014 filling the cerebral vacuum of mid summer. In any case, with these populist announcements the multitude form receives a clear message: techno-elites are starting to explicitly reclaim the governance of the world brain.

In 1962 Arthur Clarke predicted an opposite war scenario: according to him, the evolution of the World Brain will take place under two forms.³ The first form would be the construction of a World Library, a universal encyclopaedia accessible by home computers (like Wikipedia, for example).⁴ The second stage, the World Brain itself, would be a superintelligent machine used to resolve collective problems (something that is already resembling Google’s *singularity*). Clarke imagined, then, to install such a supercomputer in the war rooms of the United States and Soviet Union, envisioning a future in which nuclear escalation would be addressed as a problem of computation.⁵ Could artificial intelligence have helped to *calculate* nuclear peace? Probably, being arms race such a primitive logic scheme. Yet today, on the other hand, new conflicts seem to originate right there at the heart of these supercomputers, if we just consider the new cold war that sprung around Edward Snowden’s leaks on the PRISM wiretapping system — the very first *metadatagate*. A former CIA director has already expressed this epistemic shift of military affairs and politics in a cynical yet concise way: “We kill people based on metadata”.⁶

Cognitive capitalism and cognitive Anthropocene

Cognitive capitalism is a despotic mega-machine based on the accumulation of *valorising information*, extraction of *surplus value of code* and transformation of collective knowledge into the *machinic intelligence* of new apparatuses.⁷ Cognitive capitalism

is also a mega-machine of governance, whose imperial *nomos* is a hybrid of old national state powers with new hi-tech global corporations such as Google, Facebook, Apple, etc.⁸ The mega-machine of cognitive capitalism is easily described by the assemblage and stratification of the global infrastructures of computing, such as, for instance, search engines and social media (Google, Facebook), logistics networks and ‘the internet of things’ (Amazon, Walmart), intelligence agencies assets (see NSA’s Utah datacenter and PRISM program) and climate research institutions too. The first two cases, ‘the internet of people’ and ‘the internet of things’, are examples of an active infrastructure producing every second *big data* by tracking communication, ‘living’ commodities as well as living labour. On the other hand, the latter two cases show a sinister similarity, as they appear just to record *big data* passively, silently recording (or wiretapping) the global environment. From an epistemological point of view, it is not arbitrary to establish a parallelism between the protocols used to intercept and ‘forecast’ anti-social behaviours and terrorism and the protocols used to intercept and ‘forecast’ the anomalies of climate change.⁹ Pointing to an alleged collaboration between Google and NSA, the recent PRISM scandal shows, indeed, that the *nomos* of cognitive capitalism features a very vague distinction between new governance (*intelligence agencies*) and new economy (that turned global media corporations into *intelligence industries*, as a matter of fact).

Aside the traditional analyses on ‘cultural capital’ and ‘knowledge society’, an interesting perspective to define cognitive capitalism and its infrastructure is looking at the making of the idea of climate change and the Anthropocene itself, also understood as a further epistemic age of the humankind. This comes with no surprise, considering how computation is central to map the forces affecting the planet’s climate. The scientific observation

and, thereafter, the *political perception* of the Anthropocene itself is possible only thanks to an (apparently neutral) global network of sensors, datacentres, supercomputers and science institutions. The description of the Anthropocene is possible thanks to a massive computing machine innervating the whole Earth like a novel super-brain. As Paul Edwards shows in his book *A Vast Machine*, also climate change is a cognitive construct, whose evidence is provided by mathematical modeling used to frame raw data and give them a global meaning.¹⁰ A similar system of observation and prediction can be illustrated also by another more simple system patrolling the planetary *bios*: Google's service mapping flu outbreaks. Google Flu Trends forecasts influenza activity by aggregating related search queries and plotting a geographical map of the potential virus diffusion in the imminent future. Made public in 2008, Google Flu is often quoted to discuss the new regime of *big data*, as it clarifies Google's hegemony in *algorithmic governance*. It is not difficult to imagine a scenario in which the same breed of algorithms are applied to other *biodata* of the population, such as social unrest and new political movements. The US Department of Defense's Minerva Project has precisely this goal: developing software to predict social mobilisation and contagions by scanning digital traces like Twitter posts during the Arab Spring or the Gezi park protests in Istanbul.¹¹

Besides these examples specific to the domain of data governance, it is worth to look also at finance to grasp further layers and the proper machinic agency of cognitive capitalism.

Capital as computation (and cognition)

The 2010 Flash Crash has disclosed worldwide the fragile success of *algotrading*, or the use of High Frequency Trading algorithms to put orders on stock markets instead of and much faster than human brokers. Finance and the techniques of

financialization rely today on a computing power that is not very different from the one employed by climatology. Finance has to record and map an economic *Umwelt* that is as big as the planet. Take for instance, Nanex, a market research firm that supplies real-time data covering all the transactions of the US stock markets. Nanex records stock market data as scientists record climate data. As his founder Eric Hunsader claims: “Nanex’s database is now more than 20 times the size of NASA’s. That’s right — we’ve got more data on the stocks than we do on space.”¹² Who knows who controls the biggest and deepest and crucial data pool among Google, NSA or NASA... the example of finance, however, points to a more complex epistemic space: as finance transforms information immediately into agency and influences instantaneously the field of forces that it is meant to measure. Today’s finance turns computation into direct economic agency.

Since the times of Smith, Ricardo and Marx, capital is clearly a form of computation. The apparatuses of capital describe by themselves a complex mathematical system. After WWII the numeric dimension of capital has been coupled with the numeric dimension of cybernetics and computing machines, then gradually *subsuming* also upcoming forms of augmented intelligence. Capital, as a form of accounting, as a form of exterior mnemonic technique, is in itself a form of trans-human intelligence. Capital, on the basis of all its numeric procedures, from layman’s accounting to sophisticated algo trading, is an *institution of computation*.

Financial capitalism show the features of a cognitive apparatus directed to control the planetary economy via computing.

Donald Mackenzie is one of the few thinkers that discovered the cognitive structures buried within Marx’s notion of machine and extended them till to include the information society and the technologies of financialization.¹³ If it is true that money

works in fact as a language, as also Christian Marazzi argues,¹⁴ financialization then operates but the most extreme (machinic) evolution of language, that is computation. Maybe it is time to replace Keynes's idea of the performativity of financial conventions ("I buy those shares, as everybody is buying them right now") with *computational performativity*, as algorithms disclose a more complex and abstract space than natural languages and social imitation.

The very *Doppelgänger* of 'cognitive capital' should be the idea of the *intelligence of capital*, that is of an autonomous super-intelligence whose agency would be dystopically directed to acephalous and blind monetary accumulation — *capital thinks too*. Nick Land is the philosopher that (deeply inspired by science fiction and Deleuze and Guattari's techno-vitalism) described capitalism as an alien technological singularity coming to colonise planet earth.¹⁵ His fatalistic and often reactionary insights, however, have been reversed by the recent debate on accelerationism, that attempts to devise a political project at the same level of abstraction of current techno-capitalism.¹⁶ The 'inhuman' ethics of accelerationism has helped to strip the human of its cognitive centrality and to recognise a form of intelligence in capital's computation, that keeps returning to challenge and capture the *general intellect* of the cognitive workers.

Any (industrial or abstract) machine is nevertheless a machine of cognition, a product of observation and intuition to solve mundane problems, and it comes to shape the world after its original epistemic imprint. Any machine is a product of abstraction, of a general intellect that mirrors the diagram of its social relations. As Charles Babbage knew (before inspiring Marx), any machine comes to replace a previous division of labour, to fatally codify, compute and capitalise a set of productive actions.¹⁷ Babbage distinguished machines

to replace the division of material labour and machines to replace the division of mental labour. Also Artificial Intelligence comes to replace a set of social relations (and to produce new ones). Human intelligence transforms and ramifies: thoughts become words, words become signs, signs information, information numbers, numbers data, data metadata, metadata patterns, patterns tendencies, tendencies machinic intelligence. Every second capital is burying knowledge. The numeric dimension of capital is not just monetary, but also informational and computational — encoding knowledge any moment of its circulation.

This is a basic description of semio-capitalism, of the information machines in charge of the measurement of the social production, of what Deleuze and Guattari called “recording machines” or “machines of the second synthesis”.¹⁸ Yet the age of desiring machines seems to be over: we are asked today to complete Deleuze and Guattari’s program of machinic ontology and obliterate the schism between affection and cognition, desire and abstraction. The film *Her* by Spike Jones, about a hipster falling in love with a female personality simulated by an artificial intelligence, is a hint of how affects are projected and orchestrated by computation (by *computational industries*, in fact, that are likely replacing ‘the society of the spectacle’).

The eye of the algorithm

The idea of capital evolving as a super-human form of intelligence resembles, by the way, the reactionary idea of the state ‘as a form of life’ of the early 20th century German *Lebensphilosophie*, another not less dangerous vision of a public super-organism.¹⁹ Marx himself, in some passages, described capitalism as an “automatic subject” and his concept of capital was clearly an intuition of a technological and economic singularity — against which he opposed, without ceding, the

'intelligent resistance' of social struggles and the counter-project of a *political singularity*.²⁰ In the transition of post-Fordism, more recently, Italian *operaismo* envisioned the potential autonomy of collective intelligence and attempted to politicise apparently neutral notions such as 'knowledge society'. Today a new planetary scale of computation demands, nevertheless, a new planetary scale of politics. As the current debate on the Anthropocene points too, no political agency is possible without the recognition of a new cognitive perspective on the whole planet.

The eye of modern perspective was born through an equivalent groundbreaking paradigm shift, bringing innovative techniques of optical projection from the mathematicians of Baghdad to Florence.²¹ A further dimension of depth was so added to aesthetics, many crooked paintings were straightened and a new political vision of the collective space was inaugurated. Similarly, a further cognitive dimension has to be imported today from computation into political thought, in order to be able to 'see' and grasp the oceanic depth of the global datascape and to disclose the novel techno-complexity of the social space. Something similar happened already in cybernetics with the shift from the first order to the *second order cybernetics*, that is with the recognition of the meta-level of the observer observing the system.²² Any century produces its own epistemic rift. The making of a global datascape is calling for a new epistemic eye. We need a new Machiavelli for the new cognitive *nomos* of the Earth.

(Endnotes)

¹ Isaac Asimov, *Foundation's Edge*, New York: Doubleday, 1982. An earlier example of supermind in science fiction is found in: Olaf Stapledon, *Last and First Men: A Story of the Near and Far Future*, London: Methuen, 1930. For an overview of the notion of collective mind in political philosophy see: Charles Wolfe. "From Spinoza to the Socialist Cortex: Steps Toward the Social Brain", in D. Hauptman and W. Neidich (eds.), *Cognitive Architecture: From Biopolitics to Noopolitics*, Rotterdam: 010 Publishers, 2010.

² The issue n. 2 of *Multitudes*, May 2000, was dedicated to cognitive capitalism. The autonomist reading of post-Fordism originated across studies on 'immaterial labour' and 'mass intellectuality' around 1990 in journals such as *Luogo comune* (Rome) and *Futur Antérieur* (Paris).

³ Arthur C. Clarke, *Profiles of the Future: An Inquiry Into the Limits of the Possible*, London : Gollancz, Nov 1962. The original idea is from: H. G. Wells, *World Brain*, London: Methuen, 1938.

⁴ See also Ben Lewis's documentary *Google and the World Brain* (2013) about the Google Books project and its copyright controversies.

⁵ More analogically, it must be remembered that also chess masters, proletarians of the "natural intelligence", were employed by Soviet Union to decide the best tactical location of nukes in Cuba.

⁶ David Cole, "We Kill People Based on Metadata", *The New York Reviews of Book*, 10 may 2014.

⁷ Matteo Pasquinelli, "Der Aufstieg der Metadatenengesellschaft", *Springerin*, n. 3, 2013. See also: "Information machine and Italian Operaismo", *Theory, Culture & Society*, January 2014.

⁸ Benjamin Bratton, "The Black Stack", *e-flux*, n. 53, March 2014.

⁹ A 'forensic' approach to climatology can be found also in: *Forensis: The Architecture of Public Truth*, Berlin: Sternberg, 2014.

¹⁰ Paul Edwards, *A Vast Machine: Computer Models, Climate Data and the Politics of Global Warming*, Cambridge, MA: MIT Press, 2010.

¹¹ Nafeez Ahmed, "Pentagon preparing for mass civil breakdown", *The Guardian*, 12 June 2014.

- ¹² Quoted in: Gerald Nestler, "Mayhem in Mahwah: The Case of the Flash Crash or Forensic Reperformance In Deep Time", in: *Forensis: The Architecture of Public Truth*, Berlin: Sternberg, 2014.
- ¹³ Donald Mackenzie, *Knowing Machines: Essays on Technical Change*, Cambridge, MA: MIT Press, 1998. And: *An Engine, Not a Camera How Financial Models Shape Markets*, MIT Press, 2008.
- ¹⁴ Christian Marazzi, *The Linguistic Nature of Money and Finance*, Los Angeles: Semiotexte, 2014.
- ¹⁵ Nick Land, *Fanged Noumena: Collected Writings 1987-2007*. Falmouth: Urbanomic, 2011.
- ¹⁶ Nick Srnicek and Alex Williams, "Manifesto for an Accelerationist Politics". In: Jousha Johnson, *Dark Trajectories: Politics of the Outside*, Miami: Name, 2013. And also: Alex Williams, "Xenoeconomics and Capital Unbound", Splintering Bone Ashes blog, October 2008.
- ¹⁷ Babbage, pioneer of computation, inspired Marx's notion of division of labour. The original definition included specifically the division of mental labour. See: Charles Babbage, *On the Economy of Machinery and Manufactures*, London: Charles Knight, 1832.
- ¹⁸ Gilles Deleuze and Felix Guattari, *L'Anti-Oedipe. Capitalisme et schizophrénie*. Paris: Minuit, 1972.
- ¹⁹ Rudolf Kjellén, *Der Staat als Lebensform*. Leipzig: Hirzel, 1917.
- ²⁰ "Ein automatisches Subjekt", translated in English as "automatically active character". See: Karl Marx, *Capital*, vol. 1, chap. 4: "The General Formula for Capital", 1867.
- ²¹ Hans Belting, *Florenz und Bagdad: Eine westöstliche Geschichte des Blicks*, Munich: Beck Verlag, 2008.
- ²² Mark Hansen and Bruce Clarke, *Emergence and Embodiment: New Essays on Second-Order Systems Theory*, Durham: Duke University Press, 2009.

Matteo Pasquinelli (PhD) is a philosopher. He wrote the book *Animal Spirits: A Bestiary of the Commons* (2008), curated the anthology *Gli algoritmi del capitale* (2014) and lectures frequently at the intersection of political philosophy, media theory and cognitive sciences. His texts have been translated in many languages and he has contributed to journals and newspapers such as Springerin, Multitudes, Fibreculture, Theory Culture & Society, Leonardo, Lugar Comum, Rethinking Marxism, Open!, Libération, Il manifesto, Der Freitag. Together with Wietske Maas he wrote the *Manifesto of Urban Cannibalism*. At NGBK Berlin he is co-curating the forthcoming exhibition *The Ultimate Capital is the Sun* and the symposium *The Metabolism of the Social Brain*.

