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Book Review

CULTURE ON ALIEN SHORES

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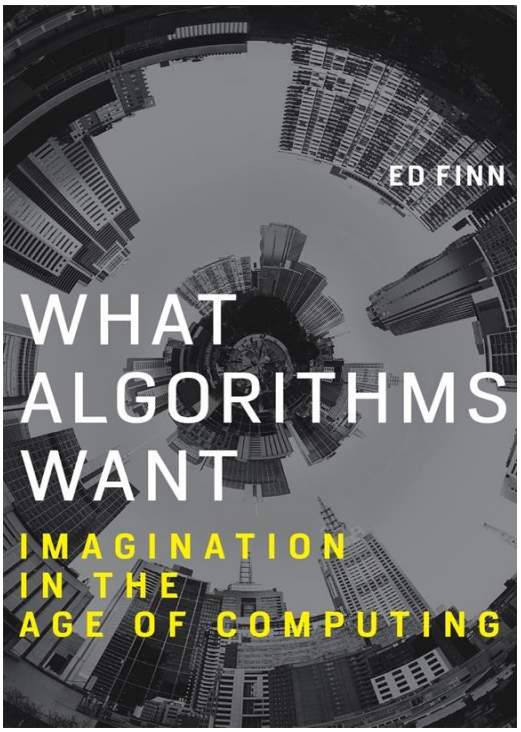
Finn, E. (2017). *What algorithms want: Imagination in the age of computing*. Cambridge, MA: MIT Press, 272 pages, ISBN: 9780262035927.



Once deemed a technical subject better left to engineering and other fields, algorithms have recently become a topic of interest among social scientists and cultural scholars. Most of this interest stems from a desire to better understand our digital world where social and cultural processes are increasingly mediated by, and interacting with, plethora of computer based, automated, algorithmic systems. While Google's search engine, Facebook's news feed algorithm (and phenomenon of "filter bubble" associated with both), product recommendation systems of Amazon and Netflix got the most public and scholarly attention, the topics are obviously not limited to them. This interest in algorithms is also

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related to some recent theoretical and methodological orientations in media and communication studies defending a closer engagement with technical and infrastructural aspects of technological media as exemplified by software studies, critical code studies, platform studies, German media theory, media archeology and digital humanities.

Ed Finn's *What algorithms want: Imagination in the age of computing* (2017) can be seen as a direct contribution to this emerging literature. As a work of "experimental humanities", it aims to develop an "algorithmic reading" which is "a way to contend with both the inherent complexity of computation and the ambiguity that ensues when that complexity intersects with human culture" (p. 2). As he states somewhere else in a more concise manner, algorithmic reading works "to make all facets of computation legible to human beings" (p. 52). This is of course a difficult task as computation and algorithms are usually thought to be operating on a sub-phenomenological and non-discursive level. They perform their magic hidden behind colorful, intuitive user interfaces and they are meant to be read by machines, not humans. Finn sidesteps this problem by conceiving algorithms as "culture machines" or "complex assemblages of abstractions, processes, and people" (p. 2) instead of expressions written in mathematical and computer languages. Barring the terminology, this is a common move in related fields where the term algorithm is often used as a synecdoche for the whole of automated socio-technical computational systems (see Gillespie, 2014).

While Finn's discussions about his method of algorithmic reading are somewhat short, they are still important and deserve a mention here because the question of how to study technical entities like code, algorithm and software is a very much unresolved, debated question in social sciences and humanities. In that respect, Finn's purported method focuses on four aspects when reading algorithms or culture machines: process, abstraction, implementation and imagination.

Discussing them in order, aspect of process is almost self-explanatory as algorithms codify processes for solving problems and executing tasks. In cultural and social contexts, this translates to attending to rule sets and operative logic of digital platforms; in Finn's own example, items selected by Facebook's news feed are less important than how selection process actually works (p. 53).

Algorithms and algorithmic systems are also abstract. As Finn points out, computers are essentially "abstraction machines" operating on the basis of intricate, long chains of them: voltage differences are abstracted to binary code, higher level programming languages are abstractions of lower level ones, graphical user interfaces

are abstractions of code and so on (p. 54). It doesn't end here of course and if we look at digital platforms, we can see that they also abstract human concepts and affects, social institutions and relationships such as friendship, love, trust, taste, popularity and relevance.

A necessary corollary to abstraction is implementation and Finn puts a big emphasis on this aspect. He points out that "computation in real-world environments is messy and contingent" (p. 47). In addition to requiring potentially colossal amounts of infrastructural and logistical work, these algorithmic and computational systems also create complex fields of interaction when they get implemented and start to do real work in real world. When they are successful, they start to create their own realities and produce effects on the original objects of their abstractions such as knowledge in Google's case and sociality in the case of social media. In a more negative manner, their abstractions and models regularly fail, errors and glitches occur, systems get gamed, hacked and they require constant modification and supervision. We tend to conceive and talk about computational system in abstract terms duped by their facade of perfect functionality while forgetting about what it takes to implement and run them in real world. As Finn quotes from Neal Stephenson's science fiction novel Snow Crash:

> [The rules of] Metaverse is nothing but a protocol, a convention that different computers agree to follow. In theory, it cannot be ignored. But in practice, it depends on the ability of different computers to swap information very precisely, at high speed, and at just the right times. (p. 50)

Finn stresses the tensions and gaps between abstraction and implementation, between hard logic of computation and soft logic of culture, "between map and territory" (p. 50). For him, "the implementation gap is the most important thing we need to know, and the thing we most frequently misunderstand, about algorithmic systems" (p. 2).

The emphasis on imagination is probably the most interesting and speculative aspect of the book. The debates about whether computers are capable of creativity and surprises go back to the invention of the medium. Against Lady Lovelace's argument that computers cannot originate anything new and can only do what they are programmed to do, Alan Turing replied that they take him "by surprise with great frequency" due to him not making all the calculations to predict the results or mistakes by him (Turing, 1950, p. 450). Today, computers play a crucial role in various creative processes and their symbol processing capabilities increased so much that, in a sense, they display what mathematical historian David Berlinski calls "intelligence on alien shores" (p. 9). For

Finn, we can get glimpses of this alien intelligence when computers "make inferences from millions of statistical variables", by looking at the field of machine learning, computer art or simply by strange glitches and bugs they produce (pp. 55, 181). While Finn concedes that it can be anthropomorphism to say computers and algorithms possess faculties of imagination or creativity, he adds that we are increasingly "imagining in concert with our machines" and "horizon of imaginative possibility is increasingly determined by computational systems" (p. 192). Finn's interest in imagination and the imaginary also manifest itself in the importance he gives to the science fiction literature and film throughout the book. Neal Stephenson's Snow Crash, Spike Jones's Her and Stanislaw Lem's Solaris play a central role in some of his analyses.

Thematically, Finn covers a wide variety of subjects and cases, ranging from Ian Bogost's satiric Facebook application Cow Clicker and gamification to high frequency trading and Bitcoin. Finn's book can sometimes feel unfocused and disorienting due to sheer number of topics, areas and fields it covers but that's somewhat expected from an experimental and exploratory book partly aimed to the general reader. Finn starts off with a thread running throughout the book: metaphors of magic. For him, algorithms, like magical incantations, are symbolic, performative and procedural. "Humanity has persistently believed that certain invocations do not merely describe the world but make it (…) computation casts a cultural shadow that is informed by this tradition of magical thinking" (pp. 1-2). Finn explores this thread from variety of angles; from popular narratives about hackers-as-magicians to the fetishization and reification of code and software in public discourse and media studies alike, a phenomenon explored extensively by Wendy Chun but also by Ian Bogost (see Chun, 2011; Bogost, 2015). While it's easy to criticize books for what they don't include, history is rich with actual links between computation and magical thinking from mythical Brazen Heads that can answer every question asked to them to Ramon Llull's Ars Magna and its forerunner, Arabic "letter magic" of zairja, the former of which inspired Leibniz to work on his famous calculus ratiocinator (see McCurdock, 2004). Those, in my opinion, would fit right into Finn's discussions about magic and computation.

What are algorithms, where do they come from and what is their ideology? These are the questions Finn tries to answer in chapter one. He begins with the definitions and historical accounts indigenous to algorithm's home disciplines of computer science and mathematics. Finn argues that we need to go beyond the common internal definitions such as "effective procedure" since they are framed from a pragmatic, engineering point

of view. Instead, we should critically investigate the "tacit assumptions lurking beneath them", that is, the "deeper philosophical claim about the nature of the universe" they depend on (p. 21). This philosophical view is commonly known as "computationalism" and the radical versions of it hold that universe is computational in nature and thus "effectively computable". Finn draws heavily upon the work of Katherine Hayles in his account of computationalism and following her he traces the origins of it to cybernetics. Rest of the chapter is devoted to methodology of algorithmic reading and discussions about magic metaphor. While Finn doesn't break much new ground here, he presents a good overview of common critical themes regarding the history of algorithms and computation.

Intelligent assistants are the focus of next chapter. Finn discusses Apple's Siri, Google's quest to build Star Trek computer with their intelligent assistant, Diderot and D'Lambert's Encyclopédie and Spike Jonze's Her. Apart from observations on the affective, conversational and gendered design of her, Finn's discussions about Siri stay mostly on the level of historical details and implementation. He then discusses Google's stated desire to build an intelligent assistant inspired by the all-knowing and super intelligent talking computer seen in Star Trek series. Finn sees parallels between endeavors of the company and the enlightenment quest for universal knowledge exemplified by Diderot and D'Lambert's Encyclopédie. For him, "before Google came to embody, in expansive and profound ways, the state of digital knowledge (what Siva Vaidyanathan has called the Googleization of Everything), the Encyclopédie took on the same radical project" (p. 68). Although it's an interesting analogy, I wonder if he pushes it a bit too far. Google's marketing rhetoric and their focus on knowledge related tasks might have a surface similarity to the ideals of enlightenment but it can also be argued that these projects are incommensurable in their logic – one is commercial, the other one is philosophical/scientific. It's undeniable that Google "does the hard cultural work of connecting things together for us" (p. 74) but I doubt enlightenment philosophers would agree the way how Google does it.

As Finn points out, search engines and intelligent assistants are also increasingly implicated in human intimacy. We share our most hidden and personal secrets with them, things that we hesitate telling even to most close to us. Finn reads Spike Jonze's Her as a parable illuminating our increasingly intimate relationships with these computational and algorithmic systems. As Finn points out, Jonze takes Apple's Siri to its logical extreme: a true conscious artificial intelligence assistant who is truly affective,

conversational and intelligent, not in a preprogrammed and scripted way like Siri. As there are already some people who jokingly flirt with Siri and develop affections towards video game characters, it doesn't take much imagination to guess that falling in love with them will be the first thing humans will do if these "conscious" artificial intelligences get invented and so does Her's human protagonist. Finn answers the titular question of the book "What algorithms want?" in this part of the book. Like Her's Samantha, algorithms want two things: "to know us completely" both in a personal and scientific sense and ascend to a higher form of knowledge similar to what Plato envisioned (p. 83).

Finn turns to case of Netflix in chapter three. He runs us through the history of Netflix's product recommendation system with its paradigm changes and experiments indicative of broader themes. To recap, when Netflix was a video rental company, their recommendation system was based on a statistical algorithm aggregating user rating on the scale of five stars. To improve this algorithm, they started up a public competition rewarding one million dollars to the winner. Though the competition was successful, they never implemented the winning algorithm and changed their recommendation system completely. After transitioning to a video streaming company, they noticed that they have large amounts of granular data about viewing habits of their consumers and found user scores inadequate by themselves. However, most recently they opted for a hybrid system incorporating human taggers, what they called "Netflix Quantum Theory" with its 76,879 micro-genres resulting in hilarious combinations such as "Violent Thrillers about cats for 8 to 10 ages". Like Amazon's Mechanical Turkers discussed by Finn in chapter five, these human taggers of Netflix operate in a similar way to what Amazon calls "artificial artificial intelligence"; as parts of a computational system, they are made to emulate machine intelligence and they take on same impersonal and mechanical qualities as the rest of the system.

The algorithmic logic of Netflix also has a big impact on company's other ventures, like producing shows such as House of Cards. Through Big Data analytics, Netflix decided that a show based on a British political drama, directed by David Fincher, having a strong female lead and starring Kevin Spacey could be a huge hit. Netflix admitted that their decision process in these matters is "%70" algorithm and data based (p. 98). According to Finn, this algorithmic logic or what he calls "aesthetics of abstraction" can be seen not only in the premise but also in the aesthetics and actual content of the show. While there is not much evidence suggesting that Fincher and his team operated in this manner, he nevertheless holds that this logic left its mark on the show. As he concludes,

"the aesthetic of abstraction permeates the show from inception to delivery, demanding a new literacy from viewers in order to participate in the work of the Netflix culture machine" (p. 109).

Next chapter is devoted to video games and the phenomenon of gamification. He starts with a discussion of Ian Bogost's satiric game Cow Clicker which was intended to be a critique of Facebook games like Farmville by pushing their design elements to absurdity. Ironically, Cow Clicker has seen moderate success on Facebook as a game on its own right. Finn mostly relies on Ian Bogost's own observations and Alexander Galloway's work in his critical analysis of social media games and gamification. After pointing out to the blurring boundaries between work and play, he turns to the case of Uber as an example of gamification. He stresses the importance of gamified interfaces of these "sharing economy" services, so much that he proposes the term "interface economy" for them. He closes the chapter trying to develop his concept of "algorithmic labor" focusing on labor processes inside these hi-tech companies with their gamified, affective and exploitative aspects.

Finn carries this economic thread to the last chapter as well and explores the topics of high frequency trading, Google's PageRank algorithm conceived as a form of arbitrage and Bitcoin. Among them Bitcoin, or more accurately, the blockchain technology underlying Bitcoin and other cryptocurrencies, is probably the most interesting and unexplored one. In a certain sense, blockchain is a very social and political technology aiming to solve issues around trust, consensus, and centralization of power via network design. It's an excellent example of what Finn means by "abstraction": a technology translating concepts and problems that occupied philosophers since the dawn of time to computational problems. Naturally, blockchain technology or Bitcoin doesn't actually solve these problems; they merely shift their anchorage points from a social, political and legal level to a computational one. With Bitcoin, instead of trusting centralized institutions such as states, legal entities and banks, we trust the computational system and take the code as "Law", as Lawrence Lessing would have it. Consequently, Finn sees in Bitcoin a new model of value, based on computation. He even goes so far as to argue that Bitcoin's computational model of value is beginning to shape culture itself.

There is no doubt that What Algorithms Want is a well written, stylish and highly original book. It explores many interesting topics and threads, both old and new. Although this thematic richness can sometimes work against it, it's still the greatest asset of the book. Finn also deserves commendation for his daring effort to develop a novel

cultural approach to computation. Overall, Finn does an excellent job exploring alien shores but be aware that the routes he takes and the places he ends up in can sometimes feel confusing.

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