# The Computerized Socialbot Turing Test

## *New Technologies of Noopower*

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> *Our machines are disturbingly lively, and we ourselves are frighteningly inert.*
> - Donna Haraway[1]
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> *The* devaluation *of the world of men is in direct proportion to the* increasing value *of the world of things.*
> - Karl Marx[2], "Estranged Labor"

## Introduction

The last tweet you got may have been from a robot.

Networks of socialbots are beginning to spread across social media. Internet users have long been familiar with bots;[3] the most benign ones are Web crawlers that index sites for search engines. Wikipedia editors may have seen some of their edits cleaned up by editing bots. Automated searches and email sorting are another type of bot built into email clients. However, socialbots are different from their more benign predecessors. According to Hwang et al, "What distinguishes these 'social' bots from their historical predecessors is a focus on creating substantive relationships among human users... and shaping the aggregate social behavior and patterns of relationships between groups of users online."[4] That is, like their name implies, socialbots are built to be *social*, to interact with us while we're in Facebook and Twitter. They also work to subtly alter how social media users interact and link with one another. Moreover, in order to more effectively shape online behavior, well-made socialbots don't appear to be bots at all; they appear to be fellow humans, with profiles, avatars, and status updates, who respond to direct messages and questions from other social media users. Although software engineering research into socialbot construction is in its infancy, there have already been successes, such as James M. Titus, a Twitter socialbot that won the 2011 Socialbot contest by gaining more followers and direct messages than other competitors.[5] Similarly, a research team from the University of British Columbia built a socialbot network which was able to befriend humans in Facebook and gathered over 250 gigabytes of private user data.[6] Finally, the U.S. Air Force is using "persona management," a tactic of managing multiple fake accounts in social networks in order to infiltrate terrorist cells.[7]

1 Donna Jeanne Haraway, “A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s,” in *The Haraway Reader* (New York: Routledge, 2004), 194.

2 Karl Marx, “Economic and Philosophical Manuscripts of 1844,” *Marxists Internet Archive*, 2009, chap. Estranged Labour, http://www.marxists.org/archive/marx/works/1844/manuscripts/preface.htm.

3 For an early description of ’bot (or “agents”), see Roger Clarke, “The Digital Persona and Its Application to Data Surveillance,” *The Information Society* 10, no. 2 (1994): 77–92, doi:10.1080/01972243.1994.9960160.

4 Tim Hwang, Ian Pearce, and Max Nanis, “Socialbots: Voices from the Fronts,” *Interactions* 19, no. 2 (April 2012): 40.

5 David Daw, “10 Twitter Bot Services to Simplify Your Life,” Magazine, *PC World*, October 23, 2011, https://www.pcworld.com/article/242338/10_twitter_bot_services_to_simplify_your_life.html; Hwang, Pearce, and Nanis, “Socialbots: Voices from the Fronts.”

6 Y. Boshmaf et al., “The Socialbot Network: When Bots Socialize for Fame and Money” (2011).

7 Stephen C. Webster, “Military’s ‘persona’ Software Cost Millions, Used for ‘classified Social Media Activities’,” Magazine, *The Raw Story*, February 22, 2011, http://www.rawstory.com/rs/2011/02/22/exclusive-militarys-persona-software-cost-millions-used-for-classified-social-

An immediate reaction one might have to the possibility that socialbots are manipulating us or gathering information on us in Twitter and Facebook is unease, especially since it is hard to tell a socialbot from a human being. It is unnerving to think that the last heartfelt tweet posted by a celebrity in Twitter might just be algorithmically selected from a pre-approved list, or that the latest friend request ultimately came from the Department of Defense. However, here I am less interested with the ethics of socialbots; instead what I want to explore in this chapter is how socialbots expose a part of the larger project of software engineering of social media, and ultimately how these bots reveal a part of social media's (noo)political economy of surveillance, attention, marketing, and manipulation. Throughout many critical examinations of social media, there is a nagging sense that human activity is reduced to datasets within the templates of sites such as Facebook, Twitter, and Google. Socialbots are concrete evidence that this nagging feeling is not unfounded, that in fact there is a radical reduction of human activities happening in social media, and moreover that this reduction serves to maintain and extend the (noo)power of social media site owners. Returning to Marx's quote above, the more we produce, the less we are, and although it is counterintuitive, this still holds in a media system where we are encouraged to produce *ourselves* via declarations of our desires and connections. Socialbots are a reflection of our activities within social media; for these machines to work, we ourselves have to be trained to be machine-like. In sum, the construction of socialbots is evidence of social media software engineering as social engineering in the age of noopolitics.

To do this, I will first explore the construction of the ur-socialbot, Alan Turing's Universal Machine. I will argue that Alan Turing's machine, as well as his famous Turing Test of computer intelligence, are founded on his idea that the human mind can be understood as a finite, discrete state machine. As such, if the various "states of mind" of humans can be encoded, they can be manipulated and imitated by computers, even to the point where a computer could appear intelligent by engaging in a conversation with a human.

I will connect this history to the concept of noopolitics. "Noopolitics" is a term coined by Maurizio Lazzarato to describe our contemporary emphasis on the politics of attention and memory.[8] "Noo" derives from *nous*, the Greek word for mind. In Lazzarato's view, the older political forms that Michel Foucault described (discipline and biopolitics) are being subsumed into the politics of attention and memory.

Next, I will briefly explore transparency and authenticity in social media. I suggest that social media's "culture of confession" is producing a massive dataset of the internal states of mind in human beings. Once this codification is done, then the universal machine (in this case, socialbots) can imitate the human in a modern day Turing test. Socialbots' success in this regard certainly raises the specter of machine intelligence. But more importantly, socialbots' success demonstrates that social media capitalism is getting more and more skilled at alienating the fruits of laborers, in this case data appropriated from social media users via surveillance and standardization. This is thus an instantiation – albeit a nascent one – of noopower: the action before action that works to shape, modulate, and attenuate the attention and memory of social media users.

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media-activities/.

8 Maurizio Lazzarato, “The Concepts of Life and the Living in the Societies of Control,” in *Deleuze and the Social*, ed. M. Fuglsang and B. Sørensen, 2006, 171–190.

## Universal Machine Transparency: Turing's Famous Machine and His More Famous Test

Socialbots are the latest in a long line of clever software meant to fool humans. To understand their heritage, we have to turn to the work of Alan Turing and his universal machine. The universal machine first appears in Alan Turing's famous 1936 paper, "On Computable Numbers, with an Application to the *Entscheidungsproblem*." This paper is seminal for two reasons: it introduces an abstract, digital computer, and it demonstrated the theoretical, mathematical limits of what this machine could effectively do. The second point, which is based in part on the *Entscheidungsproblem* (the "decision problem"), is rooted in the mathematical theories of Hilbert, Whitehead and Russell, and Gödel, and is not my concern here.[9] Suffice it to say, based on Gödel's incompleteness theorem, Turing was able to define in the abstract a machine that could compute numbers and solve problems within a formal system (while bracketing off those problems that cannot be proven within the formal system). This machine is of course the universal machine, which is my focus here.

At the heart of the universal machine is a binary system. In Charles Siefe's description, the machine

> reads information from a [infinitely long] tape. This tape is divided into squares that are either blank or have a mark written on them. A Turing machine is extremely simple. It can only perform a handful of basic functions: read what's on the tape at a given position, advance the tape or rewind it, and write or erase a mark on the tape.[10]

Turing's machine thus has a small set of logical operations (i.e., read, write, erase, advance, rewind, and so on). However, despite the simplicity of this machine, it can compute any sequence of complicated algorithms or formulas by building more complex operations out of those simple building blocks. The only requirements are that the instructions are encoded into a form the machine can read, and that the algorithms involved fit within the theoretical limits on mathematical systems outlined by Gödel. Thus, in theory any other machine's operation can be controlled or replicated by the universal machine, so long as each state of the target machine is discrete and is written in a standard format. Although "strictly speaking," Turing writes, "there are no such machines[,] [e]verything really moves continuously,"[11] because of our modern quantification of fluid phenomena such as time and space, we can divide continuous actions into discrete moments and thus decompose any continuous machine into a finite collection of states. And, since any state has its binary opposite, its non-state, the binary universal machine can be programmed to replicate any discrete state machine.

Thus, any other machine or process whose states can be divided into distinct stages is completely transparent to the universal machine. One key example is human computation.[12] During Turing's time, the machine-like aspects of human computation could be found in the rooms of mainly women who operated in a division of labor to complete small parts of large equations, processes which had been

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9 See Jack Copeland's discussion in Alan M. Turing, *The Essential Turing: Seminal Writings in Computing, Logic, Philosophy, Artificial Intelligence, and Artificial Life Plus The Secrets of Enigma*, ed. B. Jack Copeland (Oxford University Press, USA, 2004).

10 Charles Seife, *Decoding the Universe : How the New Science of Information Is Explaining Everything in the Cosmos, from Our Brains to Black Holes* (New York: Penguin Books, 2007), 18.

11 Alan M. Turing, "Computing Machinery and Intelligence," *Mind* 59, no. 236 (1950): 440.

12 The phrase "human computation" is a bit of a redundancy: "computer" used to mean "a person who computes"; the term was later applied to electronic machines that could do the complex math human computers could do. Today, of course, the idea of a human computer is odd and even comical. For an example, see a (very bad) 1969 Disney movie, *The Computer Wore Tennis Shoes*.

organized and standardized in books and by factory-like management.[13] Turing imagined that these human operations could be replaced by a machine: as Turing notes, "if one wanted to make a machine mimic the behavior of the human computer in some complex operation one has to ask him[14] [sic] how it is done, and then translate the answer into the form of an instruction table."[15] These tables are, of course, programs. We can easily imagine human computation being translated into digital computer programs, because this is exactly what has happened.[16]

However, and most importantly, Turing did not stop there: he expanded the vision of the universal machine from standardized human computation or simple discrete state machines to include the decidedly unmachinelike processes of *intelligence and thought.* He did so by suggesting that any machine that can imitate a human during a conversation must be considered intelligent. This is the famous "Turing Test," where an interrogator questions two entities and tries to decide which is human and which is the computer based on a short conversation.[17] As Turing explained the test in the 1952 BBC interview:

> The idea of the test is that the machine has to try and pretend to be a man [sic], by answering questions put to it, and it will only pass if the pretence is reasonably convincing. A considerable proportion of a jury, who should not be expert about machines, must be taken in by the pretence. They aren't allowed to see the machine itself—that would make it too easy. So the machine is kept in a far away room and the jury are allowed to ask it questions, which are transmitted through to it: it sends back a typewritten answer.[18]

By the year 2000, Turing predicted, computers would be powerful enough to fool 70% of the judges.[19] The accuracy of this prediction isn't my concern here, but I do want to emphasize that Turing's game is a game of percentages, a point I will return to later.

A conversation, in this view, is a discrete process, with two entities (an interrogator and a machine or an interrogator and a human) exchanging finite strings of encoded text. Drawing on information theory, we can say that blocks of text comprising conversations are patterns purposely selected to convey messages. As such, Turing's argument that a computer with a large enough memory and a clever set of instructions could converse with a human and fool the human into believing he or she is talking to another person can be viewed as an informational problem.[20] Moreover, the conversation is extremely limited, with no visual or auditory cues; only text is allowed.

Turing's test, proposed in 1950, has since spawned many attempts to build intelligent chat bots. A famous early example is Joseph Weizenbaum's ELIZA, an emulation of a Rogerian psychoanalyst,

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13 D. A Grier, "Gertrude Blanch of the Mathematical Tables Project," *IEEE Annals of the History of Computing* 19, no. 4 (December 1997): 18–27, doi:10.1109/85.627896; David Alan Grier, *When Computers Were Human* (Princeton, N.J: Princeton University Press, 2005); Jennifer S. Light, "When Computers Were Women," *Technology and Culture* 40, no. 3 (1999): 455–483.

14 This use of the male pronoun is wrong, and not just because it is patriarchal. At the time of Turing's writings, and indeed for many years, human computers were predominantly *women*. It was one of the few careers women with mathematical training could pursue. Women computers were involved in computation for ballistics, the Manhattan Project, and for Depression-era public assistance administration.

15 Turing, "Computing Machinery and Intelligence," 438.

16 Light, "When Computers Were Women"; Grier, *When Computers Were Human*.

17 Turing, "Computing Machinery and Intelligence."

18 Turing, *The Essential Turing*, 495.

19 Turing, "Computing Machinery and Intelligence," 442.

20 Ibid.; C. E. Shannon, "The Mathematical Theory of Communication," in *The Mathematical Theory of Communication* (U of Illinois P, 1949), 3–93; N. Wiener, *The Human Use of Human Beings: Cybernetics and Society* (Da Capo Pr, 1988).

which was successful in carrying on text-based conversations by using the tactic of responding to any user input with a question.[21] In many ways, Kenneth Colby's PARRY was a response to ELIZA; PARRY emulated a paranoiac, using a psychological disorder as a means for human interrogators to explain away non sequiters in any conversation with that bot.[22] The adoption of the Internet led to many bots living in virtual worlds like the text-based TinyMUD, some of which have been adapted to take on the Turing test.[23] In 1991, the inventor Hugh Loebner sponsored the Loebner Prize, which has been held annually to test programmers' skills in constructing programs that can pass the Turing test. Based on Turing's writings, to win the contest, a bot must convince the highest percentage of judges that it is human.

It is important to note that, for Turing and his interlocutors, the human mind is conceived of as a digital computer.[24] Consider the phrase "states of mind" as an entry-point into this idea,[25] where because "any step of the process being followed must be describable in terms of observation of symbols, changing of symbols, and change of state of mind,"[26] the mind's functions can be textually encoded and replicated by the universal machine.[27] So conceived, the mind then becomes transparent, its inner workings made visible to computation - at least as evidenced by the textual descriptions of steps and states given by people carrying out myriad tasks.[28] If, as Sherry Turkle argues, computers are our new "objects to think with,"[29] then what we seem to be thinking about with them is how it is we go about thinking. If Turing is right, our very minds can be conceived of as discrete state machines potentially imitated by computers.

Turing's suggestion that the processes of thought and intelligence can be codified and thus made transparent to the universal machine is by no means the limit of the desire to quantify seemingly unquantifiable systems. His universal machine theory has had a nearly immeasurable impact on theoretical computer science, linguistic philosophy,[30] cognitive science, biology,[31] cybernetics, genetics, and systems theories. By conceiving of their objects as consisting of discrete states, these theories seek

21 Joseph Weizenbaum, *Computer Power and Human Reason : from Judgment to Calculation* (San Francisco: W. H. Freeman, 1976); Sherry Turkle, *Life on the Screen : Identity in the Age of the Internet* (New York: Simon & Schuster, 1995).

22 M. L Mauldin, “Chatterbots, Tinymuds, and the Turing Test: Entering the Loebner Prize Competition,” in *PROCEEDINGS OF THE NATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE*, 1994, 16–16.

23 Ibid.

24 Andrew Hodges, “Alan Turing and the Turing Machine,” in *The Universal Turing Machine : a Half-century Survey*, ed. Rolf Herken (Oxford; New York: Oxford University Press, 1988), 8; Turing, “Computing Machinery and Intelligence.”

25 Martin Davis, “Mathematical Logic and the Origin of Modern Computers,” in *The Universal Turing Machine : a Half-century Survey*, ed. Rolf Herken (Oxford; New York: Oxford University Press, 1988), 154.

26 Hodges, “Alan Turing and the Turing Machine,” 4.

27 An example of this is in W. R Ashby, *Design for a Brain* (Chapman and Hall London, 1960). Ashby’s emphasis is on defining discrete states for thinking and the mind.

28 And this last is an important point. According to Webb 1980, Turing used the idea of a machine handling computable numbers by reading simple instructions to bracket off the question of an internal, unknowable intelligence within the human computer. By demonstrating that a machine could do this work just as effectively as a human computer, Turing was able to side-step the question of intelligence as inherent in an organism; after all, at the time of his early work in the 1930s, no one would consider a machine intelligent, and thus no one would accuse him of resting on a metaphysical property to explore the scope and limits of computable numbers. His only assumption regarding human intelligence is that it is finite, and thus has finite “states.” From here, of course, it's a short path to encoding such states in a theoretical machine, having the machine imitate those states, and then reconsidering the performance of such machines equipped as potential demonstrations of intelligence. Cf. Webb, *Mechanism, Mentalism, and Metamathematics*, 219–225.

29 Turkle, *Life on the Screen : Identity in the Age of the Internet*, 47.

30 See Golumbia, The Cultural Logic of Computation for a discussion of the articulations between Chomsky's linguistics and computer science.

31 Webb, *Mechanism, Mentalism, and Metamathematics*.

to bring their objects into purview of the universal machine; many of Turing's interlocutors in these fields dream of truly *universalizing* philosophies.[32]

Thus, Turing's universal machine has lead to, or at least anticipated, many modern dreams: that our language processes can be mapped and fully known; that our economy's inner workings can become completely transparent and thus made more efficient; that our weather systems can be predicted; that human behavior can be uncovered and modified with social scientific inquiry; that our neurological systems can be networked and programmed. Turing's dream - at least as it has been modified and extended in modernity - is similar to the dreams of Laplace or Taylor: that human activity, from its physical to its mental manifestations, can be known, measured, abstracted, and controlled. Indeed, examples of this dream abound and recur: consider the executive editor of *Wired Magazine*, Kevin Kelly, who argued in a best-selling business manual that we, society, and the universe are all computers, and thus whomever controls the software controls the whole show.[33]

To be fair, Turing himself probably would laugh at the vast claims to universal knowledge made in fields such as (the new) economics; after all he was critical of the Laplacian philosophy of a predictable, mechanistic universe,[34] and one fundamental aspect of his seminal essay "On computable numbers" is precisely that such systems cannot ever be complete (and thus perfect prediction is never possible). However, reading Turing closely, we should see the remarkable idea that computers can imitate any other discrete state machine; this is the heart of their incredible flexibility. Moreover – and this is the point I want to emphasize - this is the heart of the concept of radical machine transparency: if the workings of a machine (biological or otherwise) can be known (measured, quantified, and notated in a standardized manner), then that target machine is transparent to Turing's universal machine.

## Turing and Noopolitics

In addition, clearly the work of Turing, the transition from human to electronic computation, and above all the desire to encode discrete "states of mind" should be read as early noopolitical phenomena. Lazzarato and subsequent theorists contrast this form of politics with those Foucault describes as disciplinary and biopolitical. In discipline, the object is the individual body. The body is trained to work with particular instruments (pens, guns, machines). This training features the increasing granularity of motion (moving the pen while sitting upright precisely 8 inches from a desk; holding the gun while lifting the left leg to a certain height; working the drill press so the bit drills here, here, and here) and the increasing granularity of time (it should take no than 45 seconds to write this sentence; after the gun crosses the center of the body the right heel comes down; produce 35 holes in a minute). Discipline is also based upon enclosures: schools, prisons, barracks, and hospital form hermetically sealed spaces in which bodies are trained. The outside is cordoned off: one's family is of no concern to the prison warden, while thoughts of factory work are not brought with the body into the school. Within these

32 Cybernetics is perhaps the best example, because its fundamental tenets are that biological and mechanical processes are essentially the same, that such continuous processes can be divided into discrete states, and that we can shape such processes on a systems-wide (i.e., societal, evolutionary, or network) scale. Cybernetics thus enables the study of the human-as-machine, the regulation and improvement of human society via measuring change and monitoring feedback, and the production of equipment that can augment human capacity. Moreover, the discrete states observed in the human-machine and in society can be encoded, replicated, simulated, or calculated by Turing's universal machine. Cf. N. Wiener, *Cybernetics: Or, Control and Communication in the Animal and the Machine* (The MIT Press, 1965); Wiener, *The Human Use of Human Beings*; Ashby, *Design for a Brain*; G. Bowker, “How to Be Universal: Some Cybernetic Strategies, 1943-70,” *Social Studies of Science* 23, no. 1 (1993): 107–127.

33 Kevin Kelly, *New Rules for the New Economy: 10 Radical Strategies for a Connected World* (Penguin, 1999).

34 Hodges, “Alan Turing and the Turing Machine,” 5; Turing, “Computing Machinery and Intelligence,” 440.

enclosed spaces, pupils, prisoners, students, soldiers and workers are arranged in hierarchies both physically in terms of location within space and ordinally in record books.

Foucault's biopolitics extends this logic to the enclosed spaces of the nation-state. Rather than working on the individual body, biopolitics takes as its object populations, and works upon this object via metrics of life and death: birth rates, disease statistics, productivity metrics. The enclosed body politic is secured against threats to its health, such as Others beyond the borders, from viruses to foreign armies and populations, by securitization practices. Internally, liberal policies such as welfare, social security, and national health care maintain a productive body politic.

In his development of noopolitics, Lazzarato concurs with Deleuze's argument that Foucault's description of enclosure is of a historical moment (largely describing Western states in the 19th and 20th centuries) rather than of contemporary society (broadly speaking, post World War II). For Deleuze, the subjects imagined by discipline and biopower have escaped enclosure: "everyone knows that [institutions such as the family, prison, hospital, school, and factory] are finished, whatever the length of their expiration periods. It's only a matter of administering their last rites and of keeping people employed until the installation of the new forces knocking at the door."[35] These "new forces" are the modulated flows of control that seek to exploit the virtuality and possibilities of becoming existing outside enclosure. Objects of control are exchange rates, publics, global flows of commodities, and above all *minds*. As Lazzarato argues, "If disciplines moulded bodies by constituting habits mainly in bodily memory, the societies of control modulate brains and constitute habits mainly in spiritual memory."[36] Drawing on Gabriel Tarde, memory is constitutive of life itself:

> According to Tarde, without memory, without this force (a duration that conserves), without this fertile succession that contracts the before in the after, there would be no sensation, no life, no time, no accumulation and thus no growth. For Bergson, Tarde's first 'disciple', without this duration the world would be forced to start anew at every moment. The world would be a present repeating itself indefinitely, always equal to itself. Matter itself would not be possible without this duration. The creation and realisation of the sensible presuppose the activity of memory and attention, as well as their power of actualisation and repetition.[37]

As such, memory's constitutive power has been, in Lazzarato's view, the *outside* of the enclosed spaces of discipline and biopower, the virtuality and becoming that enclosure seeks to cordon off. "Memory, attention and the relations whereby they are actualised become social and economic forces that must be captured in order to control and exploit the assemblage of difference and repetition. It is by remaining faithful to this intellectual tradition that Deleuze can affirm that in 'a life there are nothing but virtuals'."[38] And here, then, we see the possibilities of *noopower*, the institutionalization of the politics of mind, wherein (to use Foucault's definition of power[39]) one mind's action shapes other minds' actions: memory and attention. Noopower, then, is a relation of power in which one mind may act before others. Such acting minds aggregate and codify the possibilities of their actions by forming institutions: mass media, polling companies, marketing research firms, and states interested in shaping public opinion. Noopower is institutionalized thought that (to borrow from Foucault) "incites... it induces, it seduces, it makes easier or more difficult; it releases or contrives, makes more probable or less; in the extreme, it constrains or forbids absolutely, but it is always a way of acting upon one or

35 Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (Winter 1992): 4, doi:10.2307/778828.
36 Lazzarato, "The Concepts of Life and the Living in the Societies of Control," 186.
37 Ibid., 184.
38 Ibid., 185.
39 Michel Foucault, "The Subject and Power," in *The Essential Foucault : Selections from Essential Works of Foucault, 1954-1984*, ed. Paul Rabinow and Nikolas S Rose (New York: New Press, 2003), 138.

more acting subjects by virtue of their acting or being capable of action."[40] Such power is a way to modulate and condition the sheer potentiality of cognitive labor power, to subtly shift the probabilities that publics will think a certain way, support particular policies, or consume goods in particular patterns.[41]

As such, Turing's interest in encoding and programming "discrete states of mind" into machines is an early move in the computerization of noopolitics. By considering how intelligent minds and digital computers could be linked, Turing is a noopolitical pioneer who saw the possibility that even thoughts could be programmed. Theorists of noopolitics, however, have largely ignored the work of Turing. This may be because the Turing test largely pits the intelligence of an individual machine against a human judge, and noopolitics and noopower involve *masses* – or more precisely, using Tarde's distintion, *publics*. The question is: could Turing's intelligent machine become a noopolitical agent, working with publics? The recent rise of socialbots provides an answer: yes.

## The Social Media Confessional Machine

Transparency is all the rage these days.

There are countless calls for transparency – i.e., radical exposure of internal details – for a wide range of entities. Government agencies must file more progress reports. In turn, states demand corporations produce reports on their finances and activities. Hospitals and healthcare providers are subject to online consumer ratings sites. Professors in higher education must quantify the learning their students have done, and universities are being pressured to share these assessments with the public.

This push for transparency extends to, and is in many ways is animated by, digitally mediated communication. In addition to large organizations exposing their finances, internal practices, and systems of expertise production, individuals are turning transparent, as well. In media studies, much has been said about the "culture of confession" we live in.[42] Confession – the revelation of private personal details to another party – is now often linked to tabloidization of the news,[43] talk shows, and reality television.[44] As such, as Nick Couldry argues, confession has become a "media ritual," a practice that reinforces the power of media in our daily lives. The media are powerful because they provide a potential space for "ordinary people" to enter and become "extraordinary."[45] Ordinary people can do so by getting in front of cameras and "getting real": presenting their lives for all to see and revealing their internal emotional states via performances.[46] Ultimately, by confessing private details, participants in reality television or talk shows deny the mystification of mass mediation by exposing elements like professional editing and the aura of the camera as socially constructed.[47] This represents a somewhat perverse modification of the feminist slogan: the personal is no longer just political, but must necessarily be public, exposed in order for us to function in the affective, knowledge economy.[48]

40 Foucault, “The Subject and Power.”
41 Akseli Virtanen, “General Economy: The Entrance of Multitude into Production,” *Ephemera: Theory & Politics in Organization* 4, no. 3 (2004): 209–32.
42 C. Taylor, *The Culture of Confession from Augustine to Foucault: a Genealogy of The’confessing Animal’* (Taylor & Francis, 2008).
43 M. Aldridge, “Confessional Culture, Masculinity and Emotional Work,” *Journalism* 2, no. 1 (2001): 91.
44 Nick Couldry, *Media Rituals : a Critical Approach* (London ; New York: Routledge, 2003); Mark Andrejevic, *Reality TV: The Work of Being Watched* (Rowman & Littlefield Publishers, Inc., 2003).
45 Couldry, *Media Rituals : a Critical Approach*.
46 Ibid., 125–126.
47 Andrejevic, *Reality TV*, 120–130.
48 Aldridge, “Confessional Culture, Masculinity and Emotional Work.”

Feeling and emotion are to be performed for ever larger audiences.[49]

We might then argue that social media has amplified and extended this practice by breaking it out of the confines of mass media, which, for all the "reality" of "reality TV," is always highly constrained. Instead, social media seems to allow us to *better* become the media by allowing users to confess and reveal their emotional and subjective states without the mediating influence of mass media gatekeepers. Marwick and boyd's work on Twitter reveals the contours of authenticity and sincerity in social media.[50] They argue authentic Tweeting is a cultural construct; to be authentic in many online cultures is to be passionate, emotional, dangerous, and intimate.[51] This is contrasted with safe, preapproved genres of discourse such as press releases, carefully crafted advertisements, edited interviews, or lawyer-vetted public statements. Marwick and boyd argue that the more effective form of Tweeting (at least as judged by the number of followers and the amount of back-and-forth discussion between the follower and the followed) is the spur of the moment, uncensored personal revelation. Whether the Twitterer be a celebrity, an "ordinary person" (to use Couldry's term), the personally branded,[52] or a micro-celebrity,[53] the path to effective communication in social media appears to be through confession and revelation of personal details.

Perhaps the best example of the confessional is in YouTube, where the aesthetics of amateur production are dominant: YouTube vlogs often feature a single person, sitting at a computer (often located in a bedroom), gazing directly into a Web cam, and – at least in the "real vlog" genre – confessing personal details.[54] The eye contact (mediated via the Web cam and computer screen) and personal details are meant to communicate the idea that this is as unmediated as YouTube can get.

The emphasis on the cultural constructs "authenticity" and "confession" is in part a reaction to the sheer noise of social media; for me to connect to a friend on Facebook, I must cut through the clamor of my friend's social stream. A strategy for doing so is to be "real," to express details of my personal life. If my audience is larger than a friend, then authenticity is far more necessary to "stand out from the crowd" as the personal branding literature often puts it. "Transparency is so chic," notes an informant in one of Marwick and boyd's Twitter studies,[55] and indeed in response to the noise of daily life, transparent confession seems refreshing.

I should note that I don't want to overemphasize this concept of the "culture of confession." In my own use of social media, I often think about what I'm Tweeting or posting, and I do take care to consider my own privacy and how I present myself to others. I am sure many people do the same. Indeed, danah boyd's research often reveals the limits of transparency and the violations of privacy that social media users often resist.[56]

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49 Eva Illouz, *Cold Intimacies: The Making of Emotional Capitalism* (Cambridge, UK: Polity, 2007).

50 A. E. Marwick and d. boyd, “I Tweet Honestly, I Tweet Passionately: Twitter Users, Context Collapse, and the Imagined Audience,” *New Media & Society* (July 2010), doi:10.1177/1461444810365313; Alice Marwick and danah boyd, “To See and Be Seen: Celebrity Practice on Twitter,” *Convergence: The International Journal of Research into New Media Technologies* 17, no. 2 (May 1, 2011): 139 –158, doi:10.1177/1354856510394539.

51 Marwick and boyd, “To See and Be Seen,” 149.

52 Robert W. Gehl, “Ladders, Samurai, and Blue Collars: Personal Branding in Web 2.0,” *First Monday* 16, no. 9 (September 5, 2011).

53 A. E. Marwick, “Status Update: Celebrity, Publicity and Self-Branding in Web 2.0” (New York University, 2010).

54 See Jean Christian, “Real Vlogs: The Rules and Meanings of Online Personal Videos,” *First Monday* 14, no. 11 (November 2, 2009), http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2699/2353 for a discussion of “real” vlogs - ie, “sincere” or “authentic” confessional vlogs - and highly produced, “fake” vlogs meant to gain audiences rather than share intimate details.

55 Marwick and boyd, “I Tweet Honestly, I Tweet Passionately,” 122.

56 danah boyd, “Facebook’s Privacy Trainwreck: Exposure, Invasion, and Social Convergence,” *Convergence* 14, no. 1

However, I also don't want to reduce the idea of confession, authenticity, or privacy to an *individual* concern. It certainly appears to be, as individual users work to personally brand themselves and become highly visible nodes in the social graph. But, as Fuller and Goffey argue, "media, cultural imaginaries and the economic ideologies of self-affirmation and opportunity seem particularly proficient at generating... a state of ever-extensible, statistically grounded, hope," which is "a correlate of unrestricted, exponential growth in the production of data."[57] Such hope, pinned to the power of individual expression, begets aggregated, big data: patterns of confession and personal details are revealed and encoded within social media's templates. Individual self-affirmation becomes a cell in a very large spreadsheet.

Importantly, a major outcome of transparent, confessional social media communication is the public production of *patterns of textually encoded, discrete states of mind*. In the language of a Web 2.0 software engineering guide, *Web 2.0 Architectures*, this is "declarative living":

> In conversations around the world, people are constantly expressing their preferences and opinions. In other words, we live *declaratively*. We declare who our friends are and who are acquaintances or business colleagues are. We talk about the videos, music, books, art, food and so on that we've encountered, the people that inspire us, and the people we'd rather avoid. It's no different on the Web, except that on the Web we can make these declarations explicitly through common formats and technologies..., or we can leave a trail of digital breadcrumbs and let other people draw their own conclusions.[58]

Research into the "Semantic Web" centers on mapping and analyzing such declarations and "digital breadcrumbs." Given the structure of social networks, where we self-affirm, where we "like," "friend," or otherwise connect with objects such as other people, movements, ideas, brands, bands, and books, complex maps of our tastes can be mapped.[59] In sum, the "big data" produced by a mass culture of confession is a boon to computational analysis.

And this is where the explosion of socialbots in sites such as Facebook and Twitter reflects a new stage in the culture of confession,[60] and, as we will see, noopower. In Facebook, Twitter, Google+, and a host of other social media sites, users are being conceived of as a discrete state desiring machine, exposing as many states of mind as possible within the frameworks provided. The hope of being one of the minority to "make it," to be hyper-valorized as a personally-branded celebrity, is explicitly linked within social media to the production of aggregates. With enough people confessing and acting real, with enough individualized - yet typified - discrete states of mind declared, a universal machine can be

(2008): 13–20; danah boyd, “Facebook and ‘radical Transparency’ (a Rant),” Blog, *Apophenia*, May 14, 2010, http://www.zephoria.org/thoughts/archives/2010/05/14/facebook-and-radical-transparency-a-rant.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+zephoria%2Fthoughts+%28apophenia%29.

57 Matthew Fuller and Andrew Goffey, “Digital Infrastructures and the Machinery of Topological Abstraction,” *Theory, Culture & Society* 29, no. 4–5 (July 1, 2012): 318, doi:10.1177/0263276412450466.

58 James Governor, Dion Hinchcliffe, and Duane Nickull, *Web 2.0 Architectures*, 1st ed. (Sebastopol CA: O’Reilly Media Inc, 2009), 191.

59 J.C. Paolillo and E. Wright, “Social Network Analysis on the Semantic Web: Techniques and Challenges for Visualizing FOAF,” *Visualizing the Semantic Web: XML-based Internet and Information Visualization* (2006): 229–241; H. Liu, P. Maes, and G. Davenport, “Unraveling the Taste Fabric of Social Networks,” *International Journal on Semantic Web and Information Systems* 2, no. 1 (2006): 42–71; Hugo Liu, “Social Network Profiles as Taste Performances,” *Journal of Computer-Mediated Communication* 13, no. 1 (2007), http://jcmc.indiana.edu/vol13/issue1/liu.html; Peter Mika, *Social Networks and the Semantic Web* (Springer, 2007).

60 Boshmaf et al., “The Socialbot Network”; J. Ratkiewicz et al., “Truthy: Mapping the Spread of Astroturf in Microblog Streams,” in *Proceedings of the 20th International Conference Companion on World Wide Web*, 2011, 249–252; “Twitter Friend Adder - Automate Twitter Bot - Robot,” accessed March 13, 2012, http://thetwitterbot.com/; Daw, “10 Twitter Bot Services to Simplify Your Life.”

used to analyze the resulting data; at higher levels of abstraction, a map of friendship can be drawn, an array of desires can be plotted on a graph, or a taxonomy of users can be created. All that is necessary is for the base machine (i.e., the myriad patterns of states of minds of the aggregated users of social media) to be sufficiently described in a standardized format, and social media sites are in fact highly standardized (as I will show in chapter 4).

It is a short path from massive databases of digitized states of mind to machines capable of playing convincing imitation games. In the words of socialbot engineers Hwang et al, "digitization drives botification; the use of technology in a realm of human activity enables the creation of software to act in lieu of humans."[61] To be certain, there is a long history of such software; email agents, bots in virtual worlds, and of course assembly-line robots all come to mind. However, according to Boshmaf et al, "What makes a socialbot different from self-declared bots (e.g., Twitter bots that post up-to-date weather forecasts) and spambots is that *it is designed to be stealthy, that is, it is able to pass itself off as a human being*."[62] In other words, in a new version of the Turing test, albeit an "unsuspecting one":[63] engineers of socialbots operating in Facebook and Twitter build them with the explicit goal of fooling humans during interactions, although part of the deception relies on the fact that humans aren't expecting to be talking to bots. However, the push to build and test the stealthiness of such bots is only possible after digitized patterns of confession have been collected and analyzed.

"Success" in the world of socialbots is similar to success in a Turing test: it's a game of probabilities and percentages. Reports from the software engineers who build them are replete with quantifications: "Over the course of the experimental period (21 days), socialbots were able to attract a total of 561 followers – an average of about 62 followers per socialbot."[64] In another, social networks "such as Facebook... can be infiltrated with a success rate of up to 80%."[65] Commercial-grade socialbots like The Twitter Bot sold online promise to increase the amount of followers by 1500 to 3500 per day.[66] These success rates are possible because the socialbot automatically and tirelessly sends a much higher number of friend or follower requests to the millions of members of Facebook or Twitter. These bots play the odds.

By the standards of the Turing test, are these socialbots intelligent? Have they fooled a large enough percentage of human "judges" within social networks? These are tantalizing questions, but this is not my focus here. Instead, I want to suggest that the ability of socialbots to pass as human might be more a function of the *a priori* reduction of human activity to predetermined datasets than due to the coding skills of socialbot engineers.

The undisclosed (i.e., "stealthy") nature of socialbots reveals one contour of this reduction. When we're logged into Facebook or Twitter, we aren't aware that we might be playing the Turing test; instead, we simply interact with digitized versions of each other – and potentially with bots. This points to the particularly *mediated* aspects of social media: the interactions are framed in particular ways, just as the original Turing test is a highly delimited form of interaction. Turing's test calls for particular limitations: the machine is to be in another room, separated from human judges, and is to interact via text. The human judges can't see or hear the machine (or the human who is also playing the imitation game to provide a comparative conversation by which to judge the machine). Nor can they speak

61 Hwang, Pearce, and Nanis, “Socialbots: Voices from the Fronts,” 40.
62 Boshmaf et al., “The Socialbot Network,” 1.
63 Mauldin, “Chatterbots, Tinymuds, and the Turing Test,” 7.
64 Max Nanis, Ian Pearce, and Tim Hwang, “PacSocial: Field Test Report” (The Pacific Social Architecting Corporation, November 15, 2011), 2.
65 Boshmaf et al., “The Socialbot Network,” 1.
66 See http://thetwitterbot.com/; last accessed 8 April 2012.

directly to the machine. Based on this, the goal is to fool 70% or more of the judges. Social media operates with similar constraints: messages are based via particular channels and forms such as status updates and comments; text boxes are limited in size (down to Twitter's famous 140 characters) and YouTube videos limited to 10 minutes apiece, image file size is capped at 100K, and so on. To be sure, the activities that take place in a Turing test or in social media are complex, but they remain delimited. Thus, although we imagine the social stream as a collection of voices – *human* voices, *authentic* voices, *confessing* voices – flowing through our browser screen, in fact these are mediated chunks of data, pushed out from a server farm and packaged in protocological wrappers (HTML, XML, Javascript, CSS, and so on). We imagine the interactions to be real time, but in fact there is a flow – albeit extremely fast – from client-user to server farm to client-user. These constraints, however cleverly coded, are the spaces into which a socialbot program can flow and possibly fool other humans, at least in a certain percentage of cases; just as the machine is hidden in Turing's game, so is the socialbot hidden in Facebook and Twitter.

This structure is part of the political economy of social media capitalism: sites such as Facebook, Twitter, and Google are built on alienating data from users in mass quantities. The low-latency lag between typing in a status update and seeing it appear in a friend's stream is the time in which the data flows to the server farm. The protocological packaging of data happens at the interface and enables rationalized storage of user data. Couple this with cleverly worded Terms of Service agreements that de facto claim ownership over anything typed in a box or uploaded to a server and we have the basic ingredients of alienated user data.

We might react to this with individual indignation: Facebook can't have *my personal* data! But just as Pappy O'Daniel said in *O Brother, Where Art Thou?*, "We ain't one-at-a-timin' here. We're mass communicating!" In other words, this is decidedly not one-by-one appropriation. What's happening is the appropriation of *masses* of data – patterns and shapes, what Terranova (following Baudrillard) calls "social entropy" of a mass that is capable of absorbing and dispersing meaning into an array of probabilities.[67] This is also a numbers game, and once again, socialbots reveal this structure. A socialbot isn't a replication of an individual online. Even the most successfully personally branded celebrity is not the target of replication by a robot. Nor are there 'bots imitating the unknowns among us. That is, there's no socialbot transversing Twitter based solely on, for example, my own profile and archive of tweets. Instead, socialbots are reflections of the *typification* of masses of users; as the Twitter socialbot project Realboy puts it, "we are not impersonating Twitter users, we are simply imitating them."[68] Just as advertising networks such as Yahoo and Google track users' movements around the Web and place them in a taxonomy of consumer types (i.e., "Sports Enthusiast," “Single Mother," and so on), socialbots replicate patterns of user activity. As a socialbot network engineering team puts it:

> ...users’ behavior in [social networks] can also be exploited to increase the likelihood of a successful infiltration [of a socialbot network]. For example, we observed that the more friends a user has, the less selective she will be when screening out friendship requests sent by a socialbot. Moreover, users are even less selective when they have mutual friends with socialbots, when the chance of accepting a friendship request from a bot reaches up to 80 percent. Second, and equally important, bots that mimic real users (e.g., by posting intriguing status updates crawled from the Web) make it difficult for other users and [social network] security defenses to identify them as bots.[69]

67 Tiziana Terranova, *Network Culture : Politics for the Information Age* (London ; Ann Arbor, MI: Pluto Press, 2004), chap. 5.

68 Available at http://ca.olin.edu/2008/realboy/, last accessed 16 April 2012.

69 Hwang, Pearce, and Nanis, “Socialbots: Voices from the Fronts,” 42.

Socialbots work because their engineers recognize broad patterns of human interaction in social media and then encode them into believable profiles. For example, socialbot engineers Boshmaf et al note that the goal is to create socialbot profiles that are "socially attractive":

> We consider a purely adversarial standpoint concerning social attractiveness; the adversary aims to exploit certain social attributes that have shown to be effective in getting users' attention. Such attributes can be inferred from recent social engineering attacks. Specifically, using a profile picture of a good looking woman or man has had the greatest impact. Thus, an adversary can use publicly available personal pictures for the newly created profiles, with the corresponding gender and age-range. In fact, the adversary can use already-rated personal pictures from websites like hotornot.com, where users publicly post their personal pictures for others to rate their "hotness".

Indeed, the quantification and digitization of the seemingly unquantifiable social trait attractiveness on hotornot.com (a site famous for posting images of women and allowing users to rate their "hotness" on scales of 1 to 10) produces one key pattern needed for socialbots. These patterns are being built, right now, via such aggregated actions of users. Because socialbot engineering is in its infancy, these simple patterns (people with many friends are less likely to screen new requests; clever status updates appear human; the triadic closure principle holds in social media; attractive people get more friends, etc.) are no doubt the tip of the iceberg – more sophisticated patterns will soon be encoded and included in these robots.

## Conclusion: Socialbots and Noopower

For Lazzarato, the philosopher Gabriel Tarde offers a way into thinking through noopolitics. Tarde conceives the public sphere "as a gigantic, instantaneous brain."[70] He sees social coordination as the action at a distance of one mind to another, evidenced by mass media communication systems. Mind-to-mind communication and instantaneous dispersion of inventions and knowledge are akin to neurons in a larger brain. This description is particularly resonant today as we think about the Internet (the "new home of Mind," to borrow a phrase from John Parry Barlow[71]). Regardless of the form of the communication network, Tarde's sociology holds that institutions that have "control of opinion, of language, of regimes of signs, of the circulation of knowledge, of consumption "[72] are the truly powerful entities in a mind-to-mind society. The institutions of noopower, then, are marketers, educators, and the sciences. In this sense, his work makes the move anticipated by Marx who argued the "general intellect" (the collective knowledge-power of society) would be the site of social struggle in the future. How can this general intellect be made (properly) productive? As Akseli Virtanen argues, this is achieved via noopower over moods, sentiments, and habits of mind:

> "The organization of immaterial production is possible only through the management of the general conditions of human action and communication, through organizing the general conditions of organizing. This organization of organization does not operate at the level of actual action or plain intimidation but on that of anxiety and inadequacy; not by confinement or demanding obedience to the rules and being afraid of their violation, but by setting expectations, moods, opinion climates, standards of communication and

70 Martin Fuglsang and Bent Meier Sørensen, *Deleuze and the Social* (Edinburgh: Edinburgh University Press, 2006), 13, http://site.ebrary.com/id/10131990.

71 John Perry Barlow, "A Declaration of the Independence of Cyberspace," *Electronic Frontier Foundation*, February 8, 1996, https://projects.eff.org/~barlow/Declaration-Final.html.

72 Lazzarato, "The Concepts of Life and the Living in the Societies of Control," 182.

> cooperation. It is the only way to control and organize labour power as an immaterial power, that is, not at the level of actual acts or products but on the level of potentiality and possibilities of life."[73]

Socialbots are one of many technologies developed over the past century to do the work of organizing organization and establishing moods and the parameters of cooperation. As a position paper for the aptly-named Pacific Social Architecting Corporation puts it, "The vision of this technology is to enable operators to actively mold and shape the social topology of human networks online to produce desired outcomes."[74] Another set of software engineers explains, "In the future, social robots may be able to subtly shape and influence targets across much larger user networks, driving them to connect with (or disconnect from) targets, or to share opinions and shape consensus in a particular direction."[75] Examples the authors offer include benign goals such as healing rifts among social groups and fighting misinformation, and certainly these can be goals of noopower institutions. But we can easily imagine more sinister uses of this technology, and the example of the military's "persona management" program points to one such possibility. Moreover, given the history of marketing, marketers will use socialbots to "bring company mascots and assets to life with little effort," as one marketing professional puts it.[76] Brands and logos could move away from catchy slogans repeated ad nauseam ("They're G-r-r-r-eat!") to automated, personalized interactions ("Let's talk about what you did today after eating Frosted Flakes!"). Extending Arlie Hochschild's landmark analysis in *The Managed Heart*, if service workers have been trained to process customers and produce pleasant "states of mind,"[77] socialbots merely represent, and continue, this labor in software form. We can now imagine a modified Turing test, in which the jury must tell the human, the robot, and the ephemeral brand apart. Which one is more intelligent? Which one is more emotionally competent? Which one fools us the highest percentage of the time? If it turns out that the socialbot/brand has a mind and a soul, how terrifying would that be?[78]

The existence of socialbots demonstrates that social media users are producing enough discrete states of mind to be imitated by the universal Turing machine. It should be clear that any system in which user activities such as expressions of opinion, desire, and emotion can be standardized and typified to the point that even robots can do the work of friending and liking is a boon to a highly rationalized system like social media capitalism. In the end, socialbots don't tell us much about *how* personal data is abstracted from users, only that it is being abstracted, and moreover that the data is standardized to the point that it can be imitated by bots. The next few chapters will explore the "how" of this process.

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73 Virtanen, “General Economy,” 229.

74 Nanis, Pearce, and Hwang, “PacSocial: Field Test Report,” 1.

75 Hwang, Pearce, and Nanis, “Socialbots: Voices from the Fronts,” 41.

76 Ibid., 44.

77 Arlie Russell Hochschild, *The Managed Heart: Commercialization of Human Feeling* (University of California Press, 1983), 6.

78 As Deleuze noted, "We are taught that corporations have a soul, which is the most terrifying news in the world. " Deleuze, “Postscript on the Societies of Control,” 6.