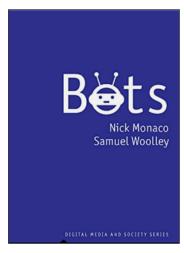Nick Monaco and Samuel Woolley, **Bots**, Cambridge, UK: Polity, 2022, 198 pp., $22.95 (paperback).

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It is impossible to read **Bots**, by Nick Monaco and Samuel Woolley, outside the prism that is ChatGPT today. In their book, they trace the early conceptualization of a bot, their role in our contemporary online lives, and a future once bots are augmented with artificial intelligence (AI). This book is useful to readers interested in social media, artificial intelligence, and the coevolution of bots and the World Wide Web. They ask the question we want answered today: "How can bots, made up of layers of code, change human culture?" (p. 122).

The answer is multiplex in nature, as is the structure of the book. They first trace the history of the bot from the early 20th century (chapter 1), then examine how bots intervene with our social (chapter 2), political (chapter 3), and economic lives (chapter 4). They end with discussion of AI and bot development (chapter 5), social theoretical discussion of bots (chapter 6), and what this means for the future (chapter 7). They contribute in three ways. First, this book provides a comprehensive snapshot of what bots were before large-language models (LLMs); second, they provide an enduring taxonomy for common bots; third, the taxonomy delineates subsequent ethical, political, and accountability concerns. They provide the lay reader an entry into the world of bots, and the expert a research companion for the various dimensions in which bots intervene with human life.

In chapter 1, the authors define what bots are: the software version of mechanical robots. They make a valuable point of how bots have predated the Internet, all the way till the 1920s. Bots were already part of infrastructural automation on organizational networks, customer service as stand-ins, and nonplayer characters in the earliest games. Apart from the historical dimension, they describe the different modalities of bots: social bots, chatbots, spambots, crawlers, colonies of bots—these are particularly useful to scholars who are looking for precise definition for bot entities, to refine their research angle. They give a lively example of the world's first chatbot ELIZA, created by Joseph Weizenbam, which utilized prewritten responses and subject changing to make users believe they were talking to a real person. In particular, when it masqueraded as a therapist and was used on Weizenbaum's secretary, she famously asked him to leave so she could have some privacy. An unwritten corollary that emerges is how the Turing Test may be tied to known expectations of the time, as the simple scripts that govern ELIZA today would not be confused as human. The goalpost for the Turing Test shifts with the contemporary technological ecosystem.

In chapter 2, the authors give examples of bots in social life, such as dating, social media discussions, and journalism. They make an important disclaimer: human intelligence is not a requisite to enact social influence. They give clear examples of how bots function in these environments, such as automating social media messages for con artists, or how bots automate news writing in rote settings like sports and finance. Importantly, they discuss how bots become seen as a social and cultural force, as they often occupy the front

end of communication. They argue that "bots should be considered and studied as a whole new form of media" (p. 35), as human communication grows increasingly bot mediated.

The chapter provides functional exposition for the third chapter—political discussions online. This is a particularly vibrant section, with global examples drawn from Russia, Taiwan, Mexico, and Bahrain. They note the shift in attitude toward social media—from optimism following the Arab Spring to pessimism post protest suppression in Mexico and Turkey—then how bots amplify these anxieties. They then provide a typology of bot tactics in manipulating public opinion, such as dampening (amplifying messages to drown out others), hashtag poisoning (overusing a hashtag in a toxic way), DDoS (Distributed Denial-of-Service) attacks (overloading servers via repeated queries), and harassment (attacks against activists using bots). The shorter, fourth chapter focuses on how bots augment business practices via customer support (in both business-to-customer and business-to-business settings), by facilitating transactions and information flow.

The fifth and sixth chapter marks the transition from comprehensive exposition to theoretical discussion. Monaco and Woolley provide a discussion of bots with AI, with a focus on the synergy with advances in natural language processing (NLP). For instance, when Jeffrey van der Goot wrote a bot, it posted "I seriously want to kill people" without his knowledge on Twitter, which drew the police to his house. To address concerns such as accountability, they draw from scholarship in science and technology studies, media studies, communication, and sociology. They center on Suchman's situated action (p. 125), Nardi's activity theory (p. 126), and Latour's actor-network theory (p. 127) with forays into contemporary literature on human-computer interaction. Given the breadth of intersecting work, this reads as more of a primer than an in-depth study. Though they do not make it explicit, they imply that bots are defined by their functional social role, whereas AI algorithms, such as deep learning models, become tools bots use to augment their function.

A central anxiety throughout *Bots* is the notion that bots "sometimes function as intelligent actors, rather than procedural or rote" (p. 122). As we enter an age where bots may easily access human-level communication, the book provides a robust framework for research and will likely serve as a critical snapshot of bots prior to the ubiquity of LLMs. It shines in its detailed explication of how bots act in various online social situations, especially political conversations, and the implications of text-based AI on the future of mediating conversation. Research and surveys on bots often focus on platforms, such as Twitter (Ferrara, Varol, Davis, Menczer, & Flammini, 2016), Facebook (Smutny & Schreiberova, 2020), or Wikipedia (Tsvekova, García-Gavilanes, Floridi, & Yasseri, 2017) but rarely discuss bots more broadly. However, they forgo chatrooms, where manipulation via disinformation can diffuse rapidly through automation but is also stymied through fact-checking bots (Chang, Haider, & Ferrara, 2021).

More critically, the discussion focuses on the functional or social role of bots—how they occupy a social network or the nuances of human-bot interaction. One core question unanswered is the boundary that separates a bot from an algorithm. Bots are special in that they are seen as agents. This is crucial as technologies like ChatGPT grow more advanced. The line between bots and algorithms needs to be made clear, as both have records of distorting public opinion. Additional scope on functionality would also be helpful. For instance, scraping bots only interface with their user, but Spambots with an entire community. As such, the examples given sometimes read as a loosely connected, nonexhaustive list. The book provides a clean exposition of things called bots, with limited exploration of what these definitions have in common, theoretically.

Division by bot functionality, directionality (public vs. private), and ontology (instantiation) would have enriched our understanding with marginal cost. One can imagine a brief introduction of core theories before a meatier dive into theorization toward the end. Additionally, given the focus on political discourse, a primer on public opinion and framing (Druckman, 2001) would enrich the stakes of online opinion manipulation. One strength of the book lies in its defining bots outside of discursive contexts. For instance, crawlers and service bots are not linguistically endowed. A missed opportunity lies in exploring the future of bots outside of text. For example, in business, automated transactions and negotiations between bots often do not take textual form, utilizing similar deep learning techniques that could parallel the section on NLP (Chang, 2021). Generative AI also has significant implications in the multimodal context. However, these are not so much weaknesses as generative follow-ups that the book naturally produces.

Overall, this book is an invaluable resource for scholars that culls two decades of contemporary bot research that will become an important benchmark for LLM-fueled bots in the decade ahead. Monaco and Woolley provide work beyond the Western context while providing a concise summary for enduring themes and questions, exemplified by the last words they leave us: "Bots are, after all, a reflection of the people who build and use them; we must work to instill our best qualities into them and keep our worst qualities out" (p. 152).

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