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In *Machine Habitus: Toward a Sociology of Algorithms* (2022), Massimo Airoldi provides a very timely theoretical contribution to the study of 'machine learning' algorithms, which are at the core of what is often referred to as artificial intelligence (AI). Airoldi presents these algorithmic systems in a way that is approachable for sociologists, particularly those familiar with a Bourdieusian set of theoretical tools. While this helps demystify technologies that are often assumed to be so complex they can only be understood by technologists, the value of Airoldi's argument ends up being limited in regards to algorithms more generally, as it depends on certain correspondences between the human and the machine.

Recent years have seen growing concerns over harmful forms of algorithmic discrimination. Sociological contributions by scholars including Safiya Noble and Ruha Benjamin have drawn attention to the ways that algorithms and machine-learning-based classification and prediction systems frequently provide outputs that are racist, or reinforce other intersecting axes of oppression and inequality. Among the developers of such systems – data scientists or AI researchers – such problems are typically discussed through the language of 'bias'. This vague and flexible concept fills the gap of social theory for AI practitioners, whose understanding is that society contains various 'biases' which then end up finding their way into algorithmic systems. Airoldi provides a much more productive way of thinking about these problems, by relating them to sociological theories about the reproduction of culture, structure, and inequality, specifically through the concept of 'habitus'.

Machine Habitus first establishes that algorithms are indeed "sociological objects". This may be obvious to sociologists for whom algorithms are a well-established topic of study, but it is a view that Airoldi articulates and justifies with clarity. The more interesting question is what kind of sociological objects algorithms are, whether they can also be agents or subjects, and what this says about humans in society. Scholars who argue for the importance of technologies in social relations and the agential status of non-human components of society often draw on the work of Bruno Latour, which is also a starting point for Airoldi, but one that he quickly moves past. In doing so, Airoldi grounds his analysis in a "less radical" view of society – one which is "compatible with the ontological grounds of classical and neoclassical social theory", and wherein *some* machines can be studied "with the same analytical machinery as people" (p. 149).

According to Airoldi, the common ground shared by humans and machine learning algorithms is that both are the products of socialization. This is what makes machine learning distinctive from other kinds of algorithms, or previous attempts at AI, in that they must 'learn' how to perform tasks on the basis of data they are 'trained' with. When this data encodes cultural distinctions, whether matters of taste or racist stereotypes, the result is "culture in the code" and a reproduction of social order. AI developers often

explain problems with bias as being based on bad data, using the phrase “garbage in, garbage out”, but the problems are social ones, or as Airoldi puts it, “society in, society out” (p. 43)

Airoldi insists that “anthropomorphism is not an option” when understanding machine learning (p. 58), because machines lack sentience or consciousness even when they effectively act as social agents. However, his argument works best when applied to the most anthropomorphic of algorithms. The book begins with a relatively obscure AI art project called IAQOS, not because it is representative of AI systems in general, but because it aligns with the theoretical argument. IAQOS is likened to a ‘baby’ that learns and communicates with the people it is exposed to -- becoming effectively socialized. Presenting AI in this manner makes it more relatable and less mysterious, but even the modest form of anthropomorphization practiced here can skew our view of algorithmic systems in unhelpful ways. The book mentions several algorithmic systems that have been at the centre of scandals over discrimination, such as the COMPAS recidivism-prediction algorithm, early versions of Google’s search algorithm, and the UK’s A-level grading algorithm. All of these relatively simple statistical algorithms reproduced problematic social distinctions, but this is possible without machine learning or anything resembling socialization. Using the language of ‘primary and secondary socialization’ to discuss how machine learning works (particularly the ‘supervised’ varieties) presents these processes in a way that is relatable for a sociological audience, but otherwise provides limited value. Airoldi shows he is well aware of these limitations in listing the ways “machine socialization” differs from the human kind, but this helps to reinforce how the book is primarily for readers who are familiar with some social theory but unfamiliar with machine learning, rather than an audience of machine learning practitioners who could greatly benefit from some grasp of social theory.

There is also the question of what kind of subject or human actor we are comparing algorithmic systems to. Given the deterministic character of computing and the statistical basis for machine learning technologies, it is notable that Airoldi finds resonance with Bourdieu’s more probabilistic statements about habitus and its development in relation to social ‘fields’. He argues that even if many “scholars have criticized Bourdieu for neglecting social actors’ agency and awareness… these criticisms do not apply to the perfectly unaware and conscienceless agents this book is mainly about” (p. 75). Human beings may be more than deterministic decision-making systems that reproduce probabilities and patterns found in our input data, but such views of ‘practice’ end up being most relevant to Airoldi’s argument.

Overall, *Machine Habitus* is an important step in bringing social theory to bear on algorithms and AI, and will be of particular interest to those interested in exploring the value and limitations of Bourdieusian ideas in this domain. While it offers a vastly superior way to look at many problems in AI which have been obscured by the language of ‘bias’, it is a social theory that is most relevant for certain categories of

algorithmic systems, and will appeal primarily to those who are trying to relate new socio-technical phenomena to well-established social theory.