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Avoid diluting democracy by algorithms

Henrik Skaug Sætra, Harald Borgebund and Mark Coeckelbergh

There is a tendency among AI researchers to use the concepts of democracy and democratization in ways that are only loosely connected to their political and historical meanings. We argue that it is important to take the concept more seriously in AI research by engaging with political philosophy.

Democracy is a staple concept in modern societies, but as with so many other popular concepts, it is constantly abused and in danger of being diluted. This is now happening in the world of AI, where researchers, for example, label their work related to social choice and voting 'democratic'[1,2] or refer to how their work contributes to 'democratization' through the use of open source code[3]. In this Comment we argue that it is crucial that research on AI and governance takes democracy as a concept seriously and avails itself of the rich and long history of democracy research from political philosophy. Doing so means that the prospects of using AI to support and engender democratic decision-making could become more than word play, while avoiding playing light and loose with a key component of modern liberal societies that is arguably already under pressure and is not in need of undermining from the AI community[4]. Furthermore, it paradoxically helps prepare the ground for stronger technocratic elements in governments at the expense of meaningful citizen involvement in politics[5,6].

We begin by briefly stating the problems associated with relying on superficial and ahistorical accounts of democracy through an examination of three examples of different uses of democracy in AI research. We then proceed to present a brief account of democracy as a concept, showing how three modern conceptualizations of democracy might enable AI researchers to connect their research to political philosophy in order to enhance their societal impact. In closing, we provide examples of how this can be done in practice.

Playing fast and loose with democracy

AI potentially relates to democracy in a number of different ways, as shown here with three different examples. Firstly, Koster et al.[1] propose a concept labelled 'Democratic AI' to help policy-makers align new policy with a populace's values. However, in our opinion the concept is essentially experimental economics coupled with machine learning. Experimental economics is a discipline in which individuals play various games to help generate evidence to test and develop economic theories, including theories of human psychology and decision-making[7]. Preferences, values and behaviour are key, and a wide range of games are used to test various aspects of human psychology. To implement 'Democratic AI', Koster et al.[1] place humans-in-the-loop and use reinforcement learning to "design a social mechanism that humans prefer by majority". The basic idea of using AI to arrive at optimal economic decisions is not new, but we find the use of the term 'democratic' in this context problematic. We show in the next sections why democracy entails more than majority voting and finding the most popular policy.

A second example relates to the democratic governance of AI, such as in Lee et al.[2], who explore how 'participatory governance' of AI can be achieved by having all citizens "specify 'objective functions' and behaviours to create desirable algorithmic policies". Social choice is also here used to aggregate quantified preferences and opinions. Finally, some use the term to refer to 'democratizing' AI. This is used both to refer to how AI itself becomes more available[8] and how AI can 'democratize policymaking' through, for example, the use of open-source code[3].

While the referenced research is both potentially important and of high quality, we object to what we see as a superficial engagement with democratic theory. This is problematic because it can dilute democracy as a concept and because it potentially precludes interdisciplinary work where AI researchers and political philosophers jointly explore the democratic potential of AI.

Democratic theory 101

Democracy can relate to a state's political system, but it can also refer to how we govern a company, family, school or even an algorithm. However, we argue that it is necessary to connect the concept to modern developments in democratic theory in order to achieve democracy at any level, and that requires actually engaging with the discipline of political philosophy[6,9].

Despite democracy's roots in ancient Greece, democracy as a form of government is a modern phenomenon that originates from the American fight for independence from the United Kingdom, the French Revolution and the development of parliamentarianizm in England. From these beginnings, democracy has gradually and slowly developed to become a dominant form of government. Nonetheless, democracy has defied a concise definition, and democratic theorists have developed many democratic models[10]. These different models emphasize different features of democracy and offer a deeper and fuller understanding of what democracy is. Associating democracy with majority rule alone entails overlooking and oversimplifying other features of democracy. We here present three classical models of democracy that could be incorporated in a deeper understanding of democratic AI.

One of the most influential models of democracy in the twentieth century is Joseph Schumpeter's[11] understanding of democracy as elections deciding which political leaders will govern. Schumpeter emphasized how democracy relies on high-quality leadership to function well, and that the role of the demos — the people — is primarily to elect a government and let them govern. If elections are competitive, political leaders will have an interest in governing well. A conception of democracy centred around the algorithms that design the policies supported by a majority misses the important point of political leadership in a democratic system. Governing, we argue, requires leadership and the ability to make strategic decisions.

Building on Schumpeter, Robert Dahl developed his pluralistic account of democracy, emphasizing the role of groups and organizations. Groups advancing their interests and the pluralism of organizations and organized interests contribute to making various parts of the

electorate heard in policy formation[12]. Associating democracy only with majority rule overlooks the important role organizations play in democracy. While there is certainly a danger that powerful actors can play too dominant a role in democratic politics because of their access to resources that can be used to influence the political process, this does not necessarily negate the important role of organizations in articulating the political views of many subsets of the electorate.

A third influential democratic theory is deliberative democracy. Building on the philosophy of Jürgen Habermas and others[13], this approach emphasises the importance of developing a political process in which the strengths of the arguments alone are decisive, and not resources or persuasive powers. Furthermore, communicative action as described by Habermas is a long way from merely voting or communicating strategically. Deliberative democracy is more demanding and constrains the democratic process more than the preceding models. An important feature of deliberative democracy is that the participants' preferences may change during the deliberations. Algorithms that try to identify the policies supported by a majority and that rely on quantification and aggregation of preferences and opinions can arguably not allow for these kinds of processes.

Habermas' approach has been criticized for being overly rationalistic and for neglecting that politics always has an agonistic dimension[14]. Emotions and questions of identity, for example, may also play a legitimate role in politics. Mouffe paints a picture of politics and the public sphere as being about power and conflict and has argued that not all tensions can or should be reconciled. She proposes agonistic and pluralistic thinking about democracy. Here too algorithms and the approach taken in the example we discuss fail to capture the complexity of democratic political processes. They do not account for aspects such as power, rhetoric and identity, which at least according to Mouffe are not necessarily a hindrance to democracy. Whether or not one agrees with Mouffe's specific view, the algorithmic and technocratic approach misses key aspects of democracies and politics entirely and is, once again, not supportive of pluralistic models of democracy.

In brief, democracy is more than majority rule. Leadership, elections, organizations, deliberations and pluralism are crucial components of it. Associating democracy with majority rule alone dilutes and diminishes democracy as a concept.

Democratic AI done right

We have argued that much AI research relies on an impoverished democracy concept, and our main concern is that this might both undermine the prospects of using AI to foster democracy and the very idea that democracy is something worth defending. Even if the invocation of democracy is intended to be entirely metaphorical, there is a danger that such use of the concept contributes to diluting it. Professionals might conflate the historical term with superficial analogies, and the broader public who sees systems labelled 'Democratic AI' without engaging sufficiently with the background of such labels might not understand that it does not refer to democracy in general. If one agrees with us that democracy, alongside human rights and the rule of law, is the way forward, we need to make sure that we take democracy seriously. We need debates on democracy in the context of AI, and we need research that engages with the various modes of democracy.

The key question now is how to use the preceding considerations when applying the concept of democracy to AI. Firstly, when debating how AI can be used to strengthen democratic political institutions, we need to consider how to incorporate political leadership, pluralism and meaningful deliberation, and not merely how AI can be used to optimize complex technical questions[5]. Politics as a concept is not akin to chess, and it is not simply a question of economic optimization. While AI might excel at aggregating preferences and experimenting with, for example, different policies, we urge developers to explore how AI might be used to promote human understanding and deliberation. Secondly, the models of democracy we have presented can be used when discussing how AI can be governed democratically, as when Buhmann and Fieseler[15] propose a model of deliberative governance of AI. This entails drawing on experience of how to design and maintain democratic institutions, which will be instrumental for reaching various goals related to responsible, trustworthy, human-centric, and so on, AI systems. Finally, talk of 'democratizing' AI, politics or anything else should be based on one of the models of democracy discussed here, and not merely making something more available or accessible, open source, or having a majority vote. Zheng et al.[3] and Lee et al.[2] have discussed the potential of democratizing policymaking through participatory coding, for example. However, in and of itself, without some form of connection with, for example, deliberative processes, this would be a hollow form of democratization. Achieving meaningful democratization of AI might in fact require a closer engagement with, for example, the UN's Sustainable Development Goals and efforts to promote local and regional competence and access to infrastructure — securing "affordable and equitable access for all"[16].

We argue that democratic theory should be seriously incorporated in AI research, and hope that our overview of some of these models helps AI researchers to connect more successfully with the rich and deep field of political philosophy. This is more than AI ethics and a focus on, for example, bias and discrimination, as it entails engaging with foundational concepts such as justice and equity, how different political institutions contribute to achieving such goals, and how technology relates to all this[6]. Importantly, we hope that engaging more seriously with the promise and pitfalls of AI and democracy will generate awareness of the danger that we are heading for a situation in which AI is applied without sufficient debate in ever more politically relevant contexts. Through this, AI could contribute to less real democracy, less meaningful human involvement in politics and citizen engagement, and increasing technocratic tendencies[5,17]. In such a situation, the corporations that have access to data, computing power and expertise would hold so much power that such a system would perhaps more accurately be described as oligarchic rather than democratic. We are arguably already well on our way to such a system, and if AI researchers are to help us to get out of that situation at all, they need to do their political philosophy homework or include such expertise in their research teams.

Henrik Skaug Sætra [1] ✉, **Harald Borgebund** [2] **and Mark Coeckelbergh** [3]

[1]Faculty of Computer Science, Engineering and Economics, Østfold University College, Halden, Norway. [2]Department of Computer Science and Communication, Østfold University College, Halden, Norway. [3]Department of Philosophy, University of Vienna, Vienna, Austria.

✉e-mail: henrik.satra@hiof.no

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References

1. Koster, R. et al. *Nat. Hum. Behav.* https://doi.org/10.1038/s41562-022-01383-x (2022).
2. Lee, M. K. et al. in *Proceedings of the ACM on Human-Computer Interaction* **3**, 1–35 (2019).

3. Zheng, S., Trott, A., Srinivasa, S., Parkes, D. C. & Socher, R. *Sci. Adv.* **8**, eabk2607 (2022).
4. Achen, C. H. & Bartels, L. M. *Democracy for realists: Why elections do not produce responsive government* (Princeton Univ. Press, 2017).
5. Sætra, H. S. *Technol. Soc.* **62**, 101283 (2020).
6. Coeckelbergh, M. *The Political Philosophy of AI* (Polity Press, 2022).
7. Davis, D. D. & Holt, C. A. *Experimental economics* (Princeton Univ. Press, 2021).
8. Kobayashi, Y., Ishibashi, M. & Kobayashi, H. *Jpn J. Radiol.* **37**, 9–14 (2019).
9. Winner, L. *Autonomous technology: Technics-out-of-control as a theme in political thought* (MIT Press, 1977).
10. Held, D. *Models of democracy* (Stanford Univ. Press, 2006).
11. Schumpeter, J. A. *Capitalism, socialism and democracy* (Routledge, 2013).
12. Dahl, R. A. *Democracy and its Critics* (Yale Univ. Press, 2008).
13. Elster, J. *Deliberative democracy: Essays on reason and politics* **3**, 18 (1997).
14. Mouffe, C. *On the political* (Routledge, 2005).
15. Buhmann, A. & Fieseler, C. *Bus. Ethics Q.* https://doi.org/10.1017/beq.2021.42 (2022).
16. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development (*Division for Sustainable Development Goals: New York, NY, USA*, 2015).
17. Sætra, H. S. *Artificial intelligence and its context: issues, domains, applications* (eds Visvizi, A. & Bodziany, M.) (Springer, 2022).

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