Democracy as Approximation: A Primer for "AI for Democracy" Innovators

Can we accelerate democratic innovation by recalling that real-world democracy is an imperfect approximation of an ideal? How might AI help?

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Real-world democracy is always an approximation—an imperfect model of an unattainable ideal. This is true whether the democratic mechanisms are elections, referendums, deliberative, liquid, participatory, and so on. Recognizing the approximate nature of democracy as it exists in reality enables us both to better *navigate the trade-offs across different democratic forms* and to *explore and evaluate new forms of democracy*.

This is particularly salient in the moment that we are living through, when democracy is at risk around the world (partially due to technology) and when democratic innovation (potentially supported by advances in technology, especially artificial intelligence) may help revitalize these faltering institutions.

But first, what exactly is democracy? Here is a definition we can build upon:

> *A method of collective decision-making characterized by a kind of equality among the participants at an essential stage of the decision-making process.*
>
> —Democracy (Standford Encyclopedia of Philosophy)

Democracy in practice contains both institutional and extitutional components:

- **Institutional** *components of democracy* involve the processes and structures that attempt to identify "the collective will" (in a way that acknowledges some form of equality) in order to apply that collective will in decision-making.
- **Extitutional** *components of democracy* encompass the experiential, relational, and organizing aspects of practicing democracy (though these can themselves become institutionalized over time, as we have seen with political parties, identity groups, etc.).

Both components are critically important, though this piece focuses on the institutional and prescriptive processes used to identify and enact some notion of the collective will of a population. For simplicity, when the term "democracy" is used below, it will primarily refer to such processes and components.

Democratic Ideals

Assuming there was the political will to enact the "ideal democracy," what challenges would we face? First, there's the challenge of *finite resources*—i.e., limited money and time to run and participate in democratic processes. Second, there's the challenge of *normative ambiguities*—i.e., differences in perspective around what "ideal" even means. This becomes clear when one considers some of the potential properties of ideal democracy, which may often be in contradiction to each other:

- Every person being impacted by a decision has equal voice around it. (In this context, "voice" refers roughly to democratic participation and influence.)
- Every person being affected by a decision has voice commensurate with its impact on them.
- Every agent being impacted by a decision has equal voice. (Instead of people, "agents" can be groups, organizations, etc.)
- Every person being impacted by a decision has voice and sufficient time to fully understand the complexity and downstream impacts of any choice (i.e., to understand what they would *want to want* if they could understand the implications of each option).
- Every decision (made by a person, agent, or system) aligns with choices that *would have resulted* from any of the aforementioned structures, even if inferred without the direct involvement of those people or agents.
- Every person being impacted by a decision *had* equal voice in determining the procedure that led to the decision (e.g., determining the laws later implemented by a judge, executive, or algorithm or determining the process for choosing that judge).

Many of these potential ideals are wildly impractical—they would take far too much time, attention, and other resources to implement. They bring up complex normative questions around equality, impacts, whether to involve people or groups, whether to allow inference, etc. However, impractical as they may be, these ideals do expose many of the directions that have been developed in the search for pragmatic forms of democracy; elections, referendums, citizens' assemblies, and participatory processes can all be seen as approximations of different aspects of these ideals.

Democracy and Attention

To illustrate how approximation works in practice, we can hone in on one resource in particular that's deeply connected to the practice of democracy: *attention*. Attention requires both time and interest; in the real world, people stop caring when the cost of attention becomes too high.

Consider the two most common modern forms of democracy: elections and referendums. With *elected representatives*, everyone allocates a very small amount of attention, which is used to delegate decision-making to representatives who, once elected, have a much more time and resources to make decisions. With referendums, a form of *direct democracy*, everyone allocates a small amount of attention to every decision. Both may operate in an extraordinarily adversarial media environment, where money and incumbency confer significant advantages due to their leverage on voter attention. In addition, with elected representatives, there can often be significant perverse incentives resulting from only some parts of the electorate voting and a need for representatives to raise money to compete effectively in the attention-driven environment.

Participatory processes let people more directly shape policy, but they generally cannot adequately compensate participants for the time and attention required (given perverse incentives, limited resources, and the variable number of people involved). These processes involve significant time and attention from those closest to the issue and those most impacted by the decisions, which can include the businesses that stand to benefit the most, people on the extremes, and marginalized populations. While this approach leaves a vast majority on the sidelines, the perspectives and voices it brings to the fore can be invaluable in policymaking.

[An increasingly common alternative](#) to all of the above, *representative deliberative processes*—e.g., deliberative democracy via *citizens' assemblies* or *deliberative polls*—involve selecting a representative microcosm of the population (e.g. 40-500 people) that allocates significant attention to the issue. These deliberators are chosen by democratic lottery (i.e., a stratified random sample) and compensated for their time (given the much smaller number involved) to learn about an issue in-depth from stakeholders, experts, and each other. They develop recommendations together, over many days or even weeks, either in-person or over video (with the support of facilitators). That depth of research and access to expertise can somewhat override the adversarial attention environment. The primary tradeoff is that most people are not chosen by the democratic lottery, and thus don't have an opportunity to participate.

In summary, we have a variety of approaches for approximating a democratic ideal based on different *allocations of attention*:

- *Elections* use **delegation**: Each voter uses a little attention, which is used to choose a few representatives who have a lot of attention.
- *Referendums* ask **everyone**: Each voter has a little attention.
- *Participatory processes* involve the **interested**: The participants who care the most *and* have the time to participate use a medium amount of attention.
- *Representative deliberative processes* use **sampling**: The representative microcosm (chosen via lottery) uses a lot of attention.

Democracy Approximations
Differing allocations of attention & influence

Elections	👁 👁 👁	Elected representatives
	👁	Voters (to choose representatives)
Referendums	👁	All eligible voters
Participatory Processes	👁 👁	'Activated' people with time
Representative Deliberative Processes	👁 👁 👁	Representative microcosm (chosen via lottery & compensated for time; e.g. in a citizens' assembly)

Complexity and Technology

Of course, these are not the only approximations that exist—and attention is just one dimension within a rich space of democratic ideals and approximations. For example, there have been in-depth explorations of voting methods that have different advantages and disadvantages depending on both pragmatic and normative components of one's democratic ideals.

Democratic processes can also provide outputs at different *levels of complexity*, ranging from binary questions to complete bills. For example, deliberative polls use similar approaches to approximation (sampling) as citizens' assemblies, but they only enable choosing from a list of items, while citizens' assemblies are usually generative processes where the output is a report drafted by the deliberators.

Relatedly, the more participants one has, the less complex responses tend to be—a thousand people cannot all engage with each other in a meaningful dialogue. However, new technology has enabled *elicitation inference* to approximate the result of thousands of people hearing and evaluating each other's perspectives. This works by having people only vote on a random or carefully chosen subset of the proposals (which takes just a few minutes), and then using machine learning to approximate what everyone would have voted on for all of the perspectives if they had had time to read them and react. (Doing this involves combining technology roughly analogous to that of TikTok's recommendations, with large language models' language understanding, to infer what people would have liked, given what they already provided.) While there are significant dangers with such approximations, especially given potential biases in the machine learning systems they depend on, there are also significant opportunities relative to the status quo—where only those setting the agenda get to choose what is being discussed and voted on.

New technologies, particularly AI-based large language models and foundation models more generally, provide incredible potential for innovative new ways to interact with each other, which can help us identify shared goals (and may even help address the very risks posed by those technologies).

Democratic Compositions

Different democratic methods can also be composed. For example, many representative deliberative processes also involve participatory inputs from the wider public. In contrast, with the Citizens Initiative Review (enshrined in Oregon state law), a very small microcosm of the population collectively writes a summary of the pros and cons of referendum questions on the ballot, which is then distributed to the broader population through the ballot guide to inform voters. There are also jurisdictions where participatory processes, such as signature collection, are used to put issues in front of representative deliberative processes for adjudication.

We can even combine some of these approaches within a single process. For instance, a process that might normally be carried out through participatory methods, such as participatory budgeting and many collective response processes, can instead be used with a representative population; this is roughly analogous to a lightweight citizens' assembly.

Composing democratic processes can thus help overcome tradeoffs of different kinds of approximation, including context, complexity, legitimacy, and more. Composition is also key to some of the other parts of a complete democratic system—it facilitates subsidiarity, keeping decisions as local as possible, and is implicitly involved in systems of checks and balances meant to protect minority rights. The art of creating a democratic process that is fit for its purpose is often the art of mastering democratic composition.

Lenses on Democracy

Understanding democracy as a rough approximation of an ideal approach to collective decision-making can help us identify new and creative ways of getting closer to that ideal—and the ways that technology might help. As mentioned, improvements in AI in particular hold incredible promise for enabling new approaches to achieve aspects of that democratic ideal. These include enhancements in routing, translation, prediction, simulation, facilitation, and more, many of which involve some form of approximation.

However, viewing democracy as processes and institutions for collective decision-making is just one lens for understanding what democracy is and can be. But democracy is much richer—it can also be a way of connecting with others, a set of evolving relationships, a negotiation among stakeholders, an assertion of organizing power, and an experiential act. Applying such alternative lenses can have a huge impact on the ultimate quality, robustness, and legitimacy of democratic processes, in addition to being an end in themselves. Moreover, any democratic institution tied to power will inevitably spawn extitutional forces aiming to support, protect, and exploit that institution—and the efforts needed to protect against the harmful side of these forces can themselves degrade a democratic approximation.

Neither process innovation, such as citizens' assemblies, nor technological innovations, such as those made possible by AI, can fully overcome the fundamental limitations of time and attention. No matter what form of democracy we are aiming for, we should remember that all democracy is, by necessity, an imperfect approximation of an ideal worth striving for. The only question is what kind of democracy we choose to cultivate with the resources that we can bring to bear.

Imagine the democratic approximation personified as a Cartographer, painstakingly working to maintain a faithful Map of an ambiguous collective will. The Map is used by Executive Agents who attempt to follow the paths it lays out—but the Map itself and process of developing it also influences that collective will. Thus, the Map is not and will never be the Territory—a perfect replica of "the" collective will—but is instead an ever-evolving approximation that, perhaps, may come closer to an unattainable ideal with each reflection and revision.

About the Author

Aviv Ovadya is the founder of the AI & Democracy Foundation, an affiliate at Harvard's Berkman Klein Center and the Centre for Governance of AI, and a research fellow at the newDemocracy Foundation. His current focus is on ensuring that the governance of AI can keep up with the rate of AI advances, particularly building on lessons from deliberative democracy. His related efforts have explored how we can address polarization and misinformation in a world of ubiquitous platform recommendation systems and generative AI. Aviv's work has been covered by the BBC, NPR, the Economist, and The New York Times and his writing has been published by Bloomberg, HBR, the MIT Technology Review, The Washington Post, and his newsletter at reimagine.aviv.me.

About the Ash Center

The Mission of the Roy and Lila Ash Center for Democratic Governance and Innovation at is to develop ideas and foster practices for equal and inclusive, multi-racial and multi-ethnic democracy and self-government.

About the Second Interdisciplinary Workshop on Reimagining Democracy

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