
Microproductivity Research and the Pursuit of a Participatory Democracy

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The Promise of Microproductivity

The promise of microproductivity for transforming the future of work is enormous. By decomposing tasks into micro-tasks, and then distributing them through the Internet, one can imagine a future in which anyone can assemble a team to accomplish complex tasks at a moment's notice. For this future to also be promising for workers, it is critical to ensure that workers are still able to contribute in creative, skillful ways, rather than ending up as low-wage workers doing menial tasks.

These promises correspond to two major directions in microproductivity research: 1) how to design algorithms that use micro-tasks to achieve complex, interdependent goals, and 2) how to create an environment that enables crowd workers to thrive.

Our main argument is that these align with steps for realizing a participatory democracy. Our hope is to encourage more microproductivity researchers to consider democracy as an application area of interest and a source of new perspectives and opportunities.

The Relation to Participatory Democracy

Participatory democracy dates back at least to the 1960s and 1970s. Its main argument is that democracy is made more meaningful when citizens are more engaged, whether directly or in supplementary roles.

In recent years, online applications have been developed that support participatory democracy. A challenge of participatory platforms is finding ways to increase engagement. The average participant has a full-time job and can only participate sparingly, if at all. This makes it critical for tasks to be lightweight, targeted to the participant, and intrinsically motivating. Once a platform has participants, it must also design algorithms that knit contributions together to produce useful information artifacts or to initiate projects for governing bodies and society at large.

Creating fun, intrinsically motivating tasks is an important direction for creating better crowd work environments. Large-scale participation algorithms can also be used for task decomposition in crowd work.

Algorithms for Decision-Making at Scale

Our prior work includes the development of algorithms that use small human contributions for decision-making at scale. Specifically, we consider how to aggregate large numbers of ideas or opinions in a crowdsourced idea generation process. We developed preference elicitation algorithms that only ask participants to complete a small number of pairwise comparisons, and yet can find ideas that would have ranked highly under a comprehensive vote [1, 2]. Our algorithms were used in a partnership with the Finland Ministry of the Environment [3]. We also studied small group decisions as building blocks for scaling decision-making, while still preserving meaningful deliberation [4, 5].

Future Directions

Our intention is to develop algorithms and platforms that go beyond decision-making to collaborative brainstorming and execution. We want to enable

communities to tackle important issues together, and to enable anyone to contribute towards that change.

Biographies

David T. Lee is a Ph.D. Candidate at Stanford University. He studies decision-making and collaboration at scale. His focus has been on algorithms for coordination and the challenge of polarization.

Hélène Landemore is an Associate Professor of Political Science at Yale University. She is the author of *Democratic Reason: Politics, Collective Intelligence, and the Rule of the Many* and co-editor of the edited volume *Collective Wisdom: Principles and Mechanisms*.

References

1. D. T. Lee, A. Goel, T. Aitamurto, H. Landemore. 2014. Crowdsourcing for Participatory Democracies: Efficient Elicitation of Social Choice Functions. *Proc. 2nd AAAI Conference on Human Comp. and Crowdsourcing (HCOMP)*, (Nov 2014).
2. D. T. Lee. 2015. Efficient, Private, and eps-Strategyproof Elicitation of Tournament Voting Rules. *Proc. 24th International Joint Conference on Artificial Intelligence (IJCAI)*, (Jul 2015).
3. T. Aitamurto, H. Landemore, D. T. Lee, A. Goel. 2014. Crowdsourced Off-Road Traffic Law Experiment in Finland. Report about idea crowdsourcing.... *Publ. of the Committee for the Future, the Parliament of Finland*, (Jan 2014).
4. A. Goel, D. T. Lee. 2012. Triadic Consensus: A Voting Rule for Crowdsourcing Applications. *Proc. of the 8th Conference on the Web, Internet, and Network Economics (WINE)*, (Dec 2012).
5. A. Goel, D. T. Lee. 2014. Large-Scale Decision-Making via Small Group Interactions: the Importance of Triads. *Workshop on Computational Social Choice (COMSOC)*, (Jun 2014).