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# Keep people in the loop: co-designing personal preference agents for energy flexibility

Large Language Model (LLM) agents are increasingly used to simulate human perspectives in domains such as research and design. There is evidence that at the population level, LLM agents can perform reasonably well in replicating general trends apparent in research with humans, including on the topic of energy. This approach is of interest because of the very significant time- and cost-efficiencies agents offer. However, substantial concerns also exist. Such models have demonstrated potential to misrepresent and stereotype groups of people on the basis of characteristics, particularly those under- or mis-represented in training data. In the absence of existing data on given topics it can be hard to validate outputs. Increasing use of agents carries the risk of exclusion of real human participation. And there are concerns about the energy and resource implications of this approach.

This talk will present work intended to mitigate these challenges by using an innovative participatory co-design process to develop personal preference agents tailored to the domain of energy use and flexibility. Twelve participants were guided through a multi-stage process: a background survey focusing on topics such as values, household, demographics, dwelling characteristics, etc. to inform an initial agent description; a co-design interview to refine and test the agent performance; and a final validation survey which also provided an opportunity to feed back on the process. The agent development process also permitted exploration of a range of scenarios presenting trade-offs between cost and energy service quality in the context of flexibility. Analysis is ongoing, and the talk will provide an overview of the method, agent and flexibility results, and reflections on the process. It will also take a critical look forward to future work and applications of LLM agent co-design in research and for energy users themselves.