Submission

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Abstract

Program Stream

- Quantitative Methods

Type of Presentation

Paper within a symposium

Title

Understanding silicon sampling through a psychometric lens

Summary

The second paper further examines how to use AI-agents to generate synthetic data through silicon sampling. As shown in the first paper and other related studies, simulations on silicon sampling have shown very different results depending on myriad LLM settings or prompting approaches. Thus, better guidelines for effective silicon sampling are needed. To understand the potential and pitfalls of silicon sampling, we present an analogy between the data generating process implied by modern psychometric (i.e., item response theory) models and that utilized by some LLMs. Through this analogy, we present what we believe many researchers hope LLMs can offer when generating synthetic data. We outline implicit assumptions that may be necessary for producing representative samples with accurate item responses. We then also provide advice on the data used to create personas for synthetic participants, prompting strategy, and understanding of some settings (e.g., temperature). Aspects of this analogy are contrasted with a machine-learning perspective and illustrated with small examples. We close with our opinion on the potential uses of silicon sampling and LLMs in psychometrics.

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