Preference Learning for Real-World Multi-Objective Decision Making
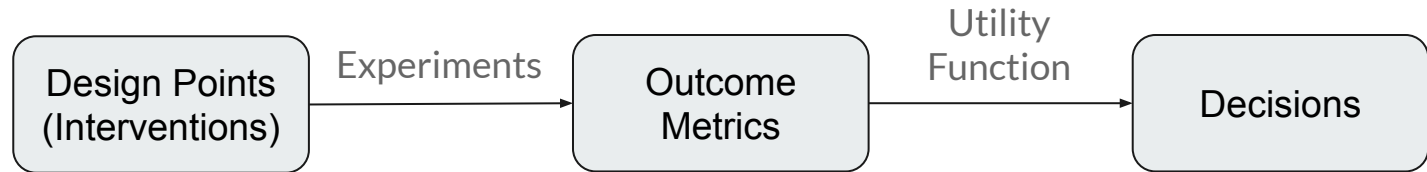
Zhiyuan "Jerry" Lin, Stanford
Adam Obeng, Facebook
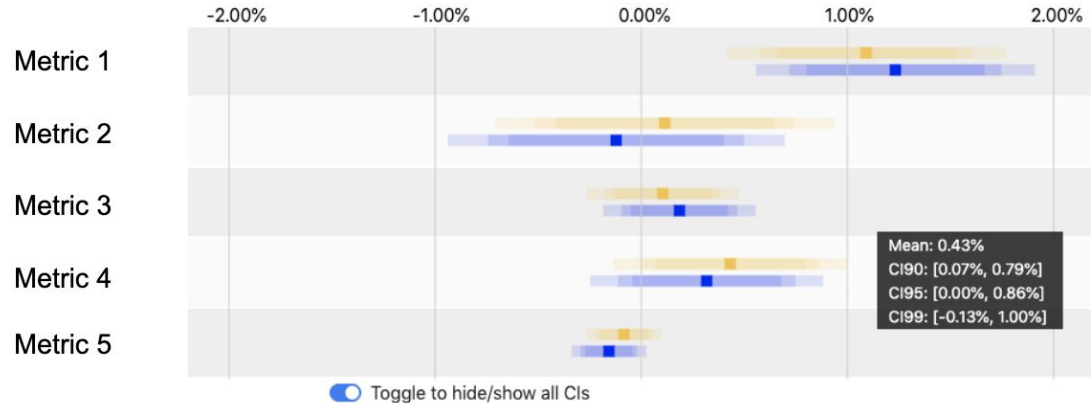**Eytan Bakshy**, Facebook

Multi-objective decision making

In Internet experimentation

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┌──────────────────┐                  ┌──────────────┐                    ┌──────────────┐
│  Design Points   │   Experiments    │   Outcome    │  Utility Function  │              │
│  (Interventions) │ ───────────────► │   Metrics    │ ─────────────────► │   Decisions  │
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User study

Preference elicitation interface

User study

Random vs. optimal outcomes
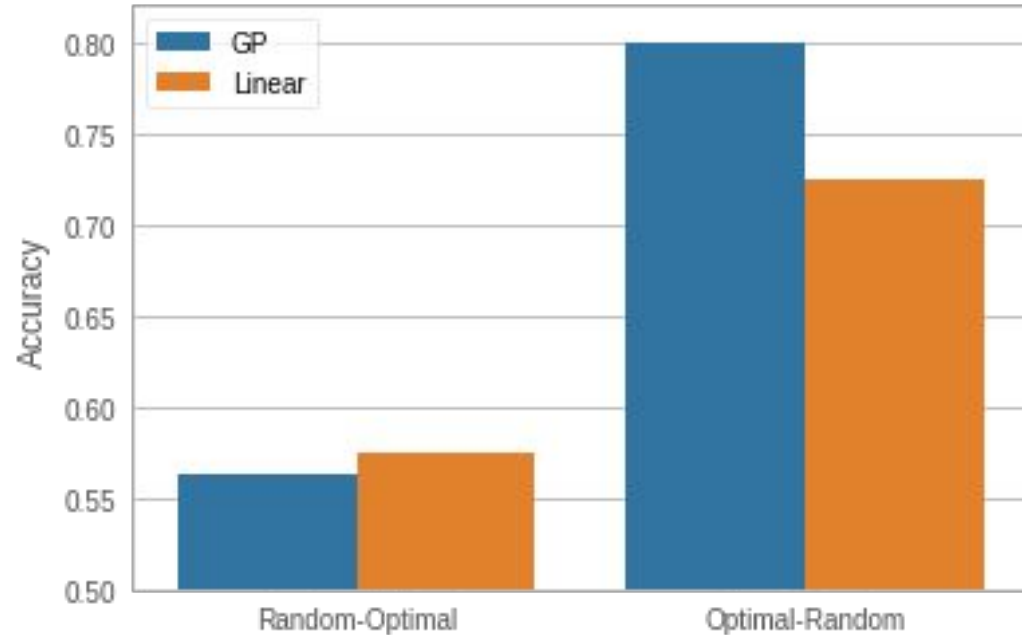
Summary

- Preference learning for real decision making utility functions in Internet experiments

- Pure exploration (i.e., random) strategy may not be the most efficient strategy for learning a good utility function in practice

- More complex models (e.g., Gaussian Processes) may better model the tradeoffs than simple linear models