

Xiangyu Zhou

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EDUCATION

University of Michigan, Ann Arbor, MI, Sep 2022 - May 2028 **Ph.D. in Computer Science**

- Ph.D. Advisor: Dr. Steve Oney

University of Washington, Seattle, WA, Sep 2018 - May 2022 **B.S. in Computer Engineering**

RESEARCH EXPERIENCE

Computational Human Behavior Modeling for Interface Evaluation

Apr 2025–Present

- Built the first computational model generating realistic human cursor steering trajectories, enabling quantitative early-stage GUI evaluation without per-variant participant recruitment.
- Designed a nonlinear Model Predictive Contouring Control (MPCC) formulation integrating four cognitive and motor human factors: reactive constraint compliance, predictive speed adaptation to local steering difficulty, motor noise, and efficiency-driven racing-line behavior.
- Personalized the model to individual users via ML, achieving behavioral fidelity comparable to held-out human performance.
- Evaluated against a human steering dataset with statistically significant results ($p < 0.01 - 0.001$) across multiple metrics; surfaced edge-case interface vulnerabilities inaccessible to traditional heuristic evaluation, complementing empirical usability testing.
- Work accepted at CHI 2026; presented to HCI and computational-interaction research audiences.

No-Code Programming for End-user

Aug 2020–Mar 2025

- Designed end-user programming systems for web automation and data analysis, combining program synthesis, LLMs, and structured user demonstrations.
- Developed SOTA search-based code generation: **22.5×** speedup on 80 real-world data analysis tasks (POPL '24); **93.9%** success rate beating prior SOTA (PLDI '22).
- Led mixed-methods user studies (qualitative interviews, behavioral observation) evaluating task demonstration efficiency and user confidence, translated findings into design iterations.
- Implemented language and runtime infrastructure (**1K–6K LOC**) in Python and Rust.
- Work accepted and presented at top-tier Programming Language System conferences (PLDI and POPL).

PUBLICATIONS

(* denotes equal contribution)

- Simulating Human Cursor Trajectories for Path-Sensitive GUI Evaluation
[Xiangyu Zhou](#), Steve Oney
CHI EA 2026 (Extended Abstracts of the ACM CHI Conference on Human Factors in Computing Systems)
- Efficient Bottom-Up Synthesis for Programs with Local Variables
Xiang Li*, [Xiangyu Zhou](#)*, Rui Dong, Yihong Zhang, Xinyu Wang
POPL 2024 (ACM SIGPLAN Symposium on Principles of Programming Languages)
- Synthesizing Analytical SQL Queries from Computation Demonstration
[Xiangyu Zhou](#), Rastislav Bodik, Alvin Cheung, Chenglong Wang
Distinguished Paper Award
PLDI 2022 (ACM SIGPLAN Conference on Programming Language Design and Implementation)

AWARDS & GRANTS

- OpenAI Researcher Access Program Grant, 2024
- SIGPLAN Professional Activities Committee Award, 2022, 2023
- Distinguished Paper Award at PLDI, 2022

TECHNICAL

- **Research methods:** experimental design, quantitative and qualitative user studies, statistical analysis, mixed-methods evaluation, behavioral data analysis
- **Human factors & HCI:** cognitive and motor modeling, usability evaluation, heuristic analysis, behavior simulation, interface evaluation
- **Machine learning:** large language models, reinforcement learning, model predictive control, neuro-symbolic methods, PyTorch
- **Programming:** Python, Rust, C/C++, Java, SQL, OCaml, R