Xiangyu Zhou

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Homepage/LinkedIn

About me: Ph.D. candidate at the University of Michigan working at the intersection of HCI, AI, and programming languages. I build computational user models that evaluate interfaces automatically, and systems that let non-programmers specify tasks through demonstrations and natural language. Seeking a Summer 2027 internship.

EDUCATION

University of Michigan, Ann Arbor, MI, Sep 2022 – May 2028 (expected) **Ph.D. in Computer Science**

- Advisor: Dr. Steve Oney

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

RESEARCH EXPERIENCE

User Simulation for Interface Evaluation Apr 2025–Present

University of Michigan, Ann Arbor, MI

- Built **computational user models** in an **agentic framework** that generate synthetic human interaction trajectories on a given interface, enabling **automated UI evaluation** that surfaces usability issues early in development.
- Designed a closed-loop simulator grounded in human-factors literature and our own user studies: a **Model Predictive Control (MPC)** drives the "arm and hand," and **regression models** predict "eye gaze horizon" Validated the simulated behavior against human data (CHI EA '26, manuscript '27).
- Built a personalization layer that fits the simulator to individual users (and **user personas**) from short calibration data, recovering per-user behavioral parameters. Evaluated model performance and generalizability.
- released the research and model code and a Chrome extension for designers.

No-Code Programming for End Users Aug 2020–Mar 2025

University of Washington & University of Michigan

- Built **no-code programming** systems for **web automation** and **data analysis**, combining **LLMs**, **program synthesis**, and structured user demonstrations so non-programmers can specify tasks by example.
- Developed search-based program synthesis algorithms: **22.5×** speedup over prior methods on real-world data analysis tasks (PLDI '22) and **93.9%** task success rate on a challenging synthesis benchmark, beating the prior state of the art (POPL '24).
- Implemented end-to-end infrastructure (**domain-specific language [DSL] design**, **language interpreter, synthesis engine**) in Python and Rust; released as an **open-source** artifact with benchmarks.
- PLDI '22 paper received a **Distinguished Paper Award (~top 8% of accepted papers)**.

SELECTED PUBLICATIONS

- Pace by Gaze: A Gaze-Informed Simulator of Constrained Cursor Movement
  Xiangyu Zhou, Beichen Xue, Yue Jiang, Steve Oney
  Manuscript under review, 2027
- Simulating Human Cursor Trajectories for Path-Sensitive GUI Evaluation
  Xiangyu Zhou, Steve Oney
  ACM CHI EA 2026 (Extended Abstracts, CHI Conference on Human Factors in Computing Systems)
- Synthesizing Analytical SQL Queries from Computation Demonstration
  Xiangyu Zhou, Rastislav Bodik, Alvin Cheung, Chenglong Wang
  Distinguished Paper Award
  ACM PLDI 2022 (ACM SIGPLAN Conference on Programming Language Design and Implementation)

TEACHING & SERVICE

- **Teaching:** Graduate Student Instructor at University of Michigan, EECS 481 Software Engineering (2 semesters), EECS 183 Elementary Programming Concepts (3 semesters)
- **Service:** Artifact Evaluation Committee, PLDI '25, POPL '25, OOPSLA '25; Reviewer, CHI '26 Extended Abstracts

TECHNICAL

- **HCI methods:** user studies, computational user modeling, usability evaluation, prototyping interactive systems
- **Machine learning & AI:** LLMs and agentic systems, Model Context Protocol (MCP), model predictive control, regression modeling, neuro-symbolic methods, PyTorch, optimization algorithm, objective function design
- **Programming:** Python, Rust, C/C++, Java, SQL, OCaml, R