

# Rui Dong

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## Education

- 2021–present **University of Michigan, Ann Arbor.**  
**Ph.D.** student in Computer Science and Engineering (GPA: 4/4)  
Advisor: Xinyu Wang
- 2018–2021 **University of Michigan, Ann Arbor.**  
**B.S.** with High Honors in Mathematics and High Honors in Computer Science (GPA: 3.89/4)  
Thesis: Web Automation using Program Synthesis

## Research Interests

My research interests lie primarily in the intersection of two areas: Programming Languages and Software Engineering. Specifically, my research interests are in program synthesis and its application. I am interested in building programming systems that utilize program synthesis to solve important problems that require program generation in different domains, including automation, optimization, and coding assistance. I am also eager to design fundamental program synthesis algorithms and adapt them to different problems.

## Publications

- 2022 **SemanticOn: Specifying Content-Based Semantic Conditions for Web Automation Programs** .  
Kevin Pu, Rainey Fu, [Rui Dong](#), Xinyu Wang, Yan Chen, Tovi Grossman  
**Honorable Mention Award**  
*ACM Symposium on User Interface Software and Technology (UIST), 2022*
- WebRobot: Web Robotic Process Automation using Interactive Programming-by-Demonstration.**  
[Rui Dong](#), Zhicheng Huang, Ian long Lam, Yan Chen, Xinyu Wang  
*Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2022*

## Research Experience

- 2022–present **Synthesis-Powered Query Optimization.**
- Constructed a query optimization benchmark set from user submissions in Leetcode.com.
  - Designed and implemented a bottom-up synthesis algorithm using CEGIS loop and using data provenance to guide the search.
  - Built an end-to-end system that integrates synthesis and testing components using Python and PostgreSQL.
- 2022–present **Mixed-Initiative Web Automation for Better User Control and Confidence.**
- Refined back-end system to support new features proposed by HCI experts and implemented the interface.
  - Participated in designing mixed-initiative version of web automation interactive system.
- 2021–2022 **Web Automation with Semantic Conditions.**
- Provided back-end support to extend the web automation interactive system.

2020–2021 **Web Automation using Program Synthesis.**

- Constructed a web automation benchmark set from an online forum.
- Designed an interactive system for users to automate tasks including interactions like scraping, data entry and navigation in web browser.
- Designed a web automation program synthesis algorithm based on a new idea called speculative rewriting.
- Implemented the algorithm and system in TypeScript and deployed it using chrome plugin and node.js.
- Conducted an user study of the interactive system.

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## Services

- 2023 PC Member of PLDI 2023 Artifact Evaluation Committee
- 2023 PC Member of VMCAI 2023 Artifact Evaluation Committee
- 2022 Student Volunteer of PLDI 2022

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## Teaching Experience

- Fall 2022 Graduate Student Instructor of EECS 481: Software Engineering
- Winter 2021 Grader of Math 416: Theory of Algorithms
- Fall 2020 Grader of Math 555: Introduction to Complex Variables

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## Awards and Grants

- 2022 Rackham International Students Fellowship
- 2022 SIGPLAN PAC Professional Activities Grant
- 2022 PLMW scholarship for PLDI 2022
- 2021 Professor Michael P. Wellman Endowed Graduate Fellowship
- 2021 PLMW scholarship for PLDI 2021

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## Skills

- Languages Mandarin(native), English(proficient)
- Programming C++; C#; Python; SQL; TypeScript