Rui Dong

+1 (916)-584-6044
ruidong@umich.edu
https://ruidong.pl

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
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 Iong 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.

Services

2023 PC Member of VMCAI 2023 Artifact Evaluation Committee

2022 Student Volunteer of PLDI 2022

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

Awards and Grants

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

Skills

Languages Mandarin(native), English(proficient)

Programming C++; C#; Python; SQL; TypeScript