

XINYU WANG

Assistant Professor
Electrical Engineering and Computer Science
University of Michigan

Bob and Betty Beyster Building 4620
2260 Hayward Street
Ann Arbor, MI 48109 USA

<https://web.eecs.umich.edu/~xwangsd/>
+1 (734)-763-1325
xwangsd@umich.edu

RESEARCH INTERESTS

My research interests are in the areas of programming languages, formal methods, and software engineering. In particular, I'm interested in developing intelligent programming systems that allow programmers and non-programmers to create reliable software easily in a correct-by-construction manner. This is a topic at the intersection of programming systems and artificial intelligence; my research draws upon and advances the state-of-the-art in both areas.

EDUCATION

- 08/2013-08/2019* **University of Texas at Austin, Austin, TX, USA**
Ph.D. in Computer Science
Thesis: An Efficient Programming-by-Example Framework
Committee: Isil Dillig (advisor), Greg Durrett, Ranjit Jhala, Mayur Naik, Keshav Pingali
- 08/2013-05/2019* **University of Texas at Austin, Austin, TX, USA**
M.S. in Computer Science
- 09/2009-07/2013* **Shanghai Jiao Tong University, Shanghai, China**
B.E. in Electrical Engineering, graduated with highest honors

EMPLOYMENT

- 09/2020-Present* **University of Michigan, Ann Arbor, MI, USA**
Assistant Professor, Electrical Engineering and Computer Science Department
- 09/2019-08/2020* **University of Michigan, Ann Arbor, MI, USA**
Visiting Assistant Professor, Electrical Engineering and Computer Science Department
- 09/2019-08/2020* **Microsoft, WA, USA**
Researcher, Program Synthesis using Examples (PROSE) team
- 06/2014-05/2019* **University of Texas at Austin, Austin, TX, USA**
Graduate Research Assistant, Computer Science Department
- 05/2015-08/2015* **Microsoft Research, Redmond, WA, USA**
Research Intern, Research in Software Engineering (RiSE) team
- 08/2013-05/2014* **University of Texas at Austin, Austin, TX, USA**
Graduate Teaching Assistant, Computer Science Department

HONORS AND AWARDS

- 2022* UIST Best Paper Honorable Mention Award [C.18]
- 2020* OOPSLA Distinguished Paper Award [C.12]
- 2016* ACM SIGPLAN PAC Award
- 2013* Dean's Excellence Award, University of Texas at Austin

PUBLICATIONS

Advisees are listed in **bold**. Xinyu Wang is underlined. Equal contributions are marked by *.

- 2022 [C.19] **Zhanhui Zhou***, Man To Tang*, **Qiping Pan***, Shangyin Tan, Xinyu Wang, Tianyi Zhang
[INTENT: Interactive Tensor Transformation Synthesis](#)
Proceedings of the ACM Symposium on User Interface Software and Technology (UIST), 2022
- [C.18] Kevin Pu, Rainey Fu, **Rui Dong**, Xinyu Wang, Yan Chen, Tovi Grossman
[SemanticOn: Specifying Content-Based Semantic Conditions for Web Automation Programs](#)
Proceedings of the ACM Symposium on User Interface Software and Technology (UIST), 2022
 **Best Paper Honorable Mention Award**
- [C.17] Zhengkai Wu, Vu Le, Ashish Tiwari, Sumit Gulwani, Arjun Radhakrishna, Ivan Radiček, Gustavo Soares, Xinyu Wang, Zhenwen Li, Tao Xie
[NL2Viz: Natural Language to Visualization via Constrained Syntax-Guided Synthesis](#)
The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), 2022
- [C.16] **Rui Dong**, **Zhicheng Huang**, **Ian Iong Lam**, Yan Chen, Xinyu Wang
[WebRobot: Web Robotic Process Automation using Interactive Programming-by-Demonstration](#)
Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2022
- 2021 [C.15] Qiaochu Chen, Aaron Lamoreaux, Xinyu Wang, Greg Durrett, Osbert Bastani, Isil Dillig
[Web Question Answering with Neuro-Symbolic Program Synthesis](#)
Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2021
- [C.14] Shankara Pailoor, Yuepeng Wang, Xinyu Wang, Isil Dillig
[Synthesizing Data Structure Refinements from Integrity Constraints](#)
Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2021
- [C.13] Tianyi Zhang, **Zhiyang Chen**, **Yuanli Zhu**, Priyan Vaithilingam, Xinyu Wang, Elena Glassman
[Interpretable Program Synthesis](#)
Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2021
- 2020 [C.12] Shankara Pailoor, Xinyu Wang, Hovav Shacham, Isil Dillig
[Automated Policy Synthesis for System Call Sandboxing](#)
Proceedings of the ACM on Programming Languages (OOPSLA), 2020
 **ACM SIGPLAN Distinguished Paper Award**
- [C.11] Xi Ye, Qiaochu Chen, Xinyu Wang, Isil Dillig, Greg Durrett
[Sketch-Driven Regular Expression Generation from Natural Language and Examples](#)
Transactions of the Association for Computational Linguistics (TACL), 2020
- [C.10] Tianyi Zhang, London Lowmanstone, Xinyu Wang, Elena Glassman
[Interactive Program Synthesis by Augmented Examples](#)
Proceedings of the ACM Symposium on User Interface Software and Technology (UIST), 2020
- [C.9] Qiaochu Chen, Xinyu Wang, Xi Ye, Greg Durrett, Isil Dillig
[Multi-Modal Synthesis of Regular Expressions](#)
Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2020
- 2018 [C.8] Yuepeng Wang, Xinyu Wang, Isil Dillig
[Relational Program Synthesis](#)

- Proceedings of the ACM on Programming Languages (OOPSLA)*, 2018
- [C.7] Xinyu Wang, Greg Anderson, Isil Dillig, Ken McMillan
[Learning Abstractions for Program Synthesis](#)
International Conference on Computer Aided Verification (CAV), 2018
- [C.6] Navid Yaghmazadeh, Xinyu Wang, Isil Dillig
[Automated Migration of Hierarchical Data to Relational Tables using Programming-by-Example](#)
Proceedings of the VLDB Endowment (VLDB), 2018
- [C.5] Xinyu Wang, Isil Dillig, Rishabh Singh
[Program Synthesis using Abstraction Refinement](#)
Proceedings of the ACM on Programming Languages (POPL), 2018
- 2017 [C.4] Xinyu Wang, Isil Dillig, Rishabh Singh
[Synthesis of Data Completion Scripts using Finite Tree Automata](#)
Proceedings of the ACM on Programming Languages (OOPSLA), 2017
- 2016 [C.3] Xinyu Wang, Sumit Gulwani, Rishabh Singh
[FIDEX: Filtering Spreadsheet Data using Examples](#)
Proceedings of the ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 2016
- 2015 [C.2] Yu Feng, Xinyu Wang, Isil Dillig, Calvin Lin
[EXPLORER : Query- and Demand-Driven Exploration of Interprocedural Control Flow Properties](#)
Proceedings of the ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 2015
- [C.1] Yu Feng, Xinyu Wang, Isil Dillig, Thomas Dillig
[Bottom-up Context-Sensitive Pointer Analysis for Java](#)
Asian Symposium on Programming Languages and Systems (APLAS), 2015

TEACHING

Instructor (University of Michigan)

<i>Winter 2023</i>	EECS 481. Software Engineering (Undergraduate Level)
<i>Fall 2022</i>	EECS 481. Software Engineering (Undergraduate Level)
<i>Winter 2022</i>	EECS 481. Software Engineering (Undergraduate Level)
<i>Fall 2021</i>	EECS 598. Intelligent Programming Systems (Graduate Level)
<i>Fall 2021</i>	EECS 498. Intelligent Programming Systems (Undergraduate Level)
<i>Winter 2021</i>	EECS 203. Discrete Mathematics (Undergraduate Level)
<i>Fall 2020</i>	EECS 598. Program Synthesis: Techniques and Applications (Graduate Level)

ADVISING

Ph.D. students

<i>08/22-Present</i>	Xiangyu Zhou
<i>08/21-Present</i>	Rui Dong

Undergraduates

<i>09/2021-Present</i>	Yuxuan Zhu
<i>06/2022-Present</i>	Kellen Kanarios: NSF REU, Engineering Honors Thesis
<i>06/2022-Present</i>	Wufang Hong
<i>06/2022-Present</i>	Pinhan Zhao: intern;
<i>09/2022-Present</i>	Ruowang Sun: directed study;

- 09/2022-Present Brian Zhang: directed study;
- Alumni (UM undergraduate students)**
- 2022 Benjamin Guilliat (2021-2022): NSF REU;
 Zhicheng Huang (2021-2022): directed study, PLDI'22;
 Sam Korman (2021-2022): NSF REU, Honors Capstone, then UM MS;
 Nicole Lam (2021-2022): directed study, PLDI'22;
 Minhao Li (2021-2022): then UM MS;
 Yiliang Liang (2021-2022): SURE, NSF REU;
 Xiaoyu Liu (2022-2022): SURE;
 Yukun Lou (2021-2022): SURE, directed study, then UM MS;
 Hunter Muench (2022-2022): SURE, NSF REU;
 Qiping Pan (2021-2022): UIST'22, then UM MS;
 Ka Yu Wong (2021-2022): directed study;
 Jiacheng Zhang (2022-2022): SURE;
 Yuntao Zhang (2021-2022): directed study, then UM MS;
 Lan Zhang (2021-2022); directed study;
 Zhanhui Zhou (2021-2022): UIST'22, then Sensetime;
- 2021 Arav Agarwal (2021-2021): then CMU MS;
 Yuyang Bai (2020-2021): directed study, then Columbia MS;
 Zhiyang Chen (2020-2021): directed study, then U. Toronto MS;
 Rui Dong (2020-2021): directed study, Honors Thesis, then UM PhD;
 Yitao Huang (2021-2021);
 Pengyuan Huang (2020-2021): directed study, then GaTech MS;
 Junliang Huang (2021-2021): directed study;
 Brian Hwang (2021-2021): NSF REU;
 Teresa Lee (2021-2021): NSF REU;
 Justin Liu (2021-2021): NSF REU;
 Lyubing Qiang (2021-2021): then UCLA MS;
 Zewen Wu (2021-2021): then UM MS;
 Kaiyang Yu (2021-2021): directed study, then CMU MS;
 Zitong Zhao (2021-2021): directed study;
 Haotian Zheng (2021-2021): directed study;
 Yuanli Zhu (2020-2021): then UM MS;
- 2020 Yihao Huang (2020-2020): then UM MS;
 Yuetao Li (2020-2020): then Google;

SERVICE

Program Committee Chair or Co-Chair

- 2023 Programming Language Design and Implementation (PLDI) – Artifact Evaluation
 2022 Programming Language Design and Implementation (PLDI) – Artifact Evaluation
 2020 Computer-Aided Verification (CAV) – Artifact Evaluation

Program Committee

- 2022 Workshop on Synthesis (SYNT), co-located with CAV
 2022 Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)
 2022 Programming Language Design and Implementation (PLDI)
 2021 Asian Symposium on Programming Languages and Systems (APLAS)
 2021 Systems, Programming, Languages, and Applications: Software for Humanity (SPLASH) – Student Research Competition
 2021 Programming Language Design and Implementation (PLDI)
 2020 Computer-Aided Verification (CAV)
 2020 Workshop on Synthesis (SYNT), co-located with CAV

2019 Static Analysis Symposium (SAS) – Artifact Evaluation

External Review Committee

2023 Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)

External Reviewer

2023 Symposium on Principles of Programming Languages (POPL)

2021 Foundations of Software Science and Computation Structures (FoSSaCS)

2020 Symposium on Principles of Programming Languages (POPL)

Journal Reviewer

2020 ACM Transactions on Programming Languages and Systems (TOPLAS)

2020 IEEE Transactions on Software Engineering (TSE)

Ph.D. Dissertation Committee

2023 Rebecca Krosnick (University of Michigan)

2022 Andrew Wintenberg (University of Michigan)

2021 Subarno Banerjee (University of Michigan)

Undergraduate Thesis Advisor (University of Michigan)

2023 Kellen Kanarios (Engineering Honors Thesis)

2022 Sam Korman (Honors Capetone)

2021 Rui Dong (Honors Thesis)

Departmental Service (University of Michigan)

2022-2023 SURE Program Faculty Coordinator

2022-2023 PhD Admissions Committee

2021-2022 SURE Program Faculty Coordinator

2021-2022 PhD Admissions Committee

2020-2021 PhD Admissions Committee

National Science Foundation

2020 Grant Review Panel

Outreach

09/2022 “Academia vs. Industry Q&A Panel with Current CSE Faculty” at the “Explore Graduate Studies in Computer Science and Engineering” Workshop (University of Michigan)

08/2022 “My Computer Science Career Path” talk at Python Bootcamp (University of Michigan)

FUNDING

2022-2026 NSF MEDIUM, \$450K (725K total), PI

2022 NSF REU Supplement, \$16K, PI

2022 Michigan Seeding to Accelerate Research Themes Funding, \$15K (\$30K total), PI

2022 Michigan Provost’s Early Tenure-Track Faculty Research Support, \$3K, PI

2021 NSF REU Supplement, \$16K, PI

2021-2025 NSF FMitF, \$400K (\$750K total), PI

2021 Michigan College of Engineering Grant, \$3K, PI

TALKS

Program Synthesis: Applications and Techniques

12/2021 Peking University (virtual)

Program Synthesis: Applications and Techniques

10/2020 CSE Seminar Series, University of Michigan (virtual)

A Unified Program Synthesis Framework For Automating End-User Programming Tasks

07/2019 Shanghai Jiao Tong University, Shanghai, China

05/2019 Galois, Portland, OR, USA

04/2019 Stanford University, Stanford, CA, USA

04/2019 University of Michigan, Ann Arbor, MI, USA

04/2019 Microsoft Research, Redmond, WA, USA

04/2019 University of Southern California, Los Angeles, CA, USA

03/2019 Georgetown University, Washington D.C., USA

03/2019 Massachusetts Institute of Technology, Boston, MA, USA

02/2019 University of British Columbia, Vancouver, Canada

02/2019 Oregon State University, Corvallis, OR, USA

02/2019 VMware Research, Palo Alto, CA, USA

Program Synthesis Using Program Abstractions

02/2019 PL Lunch Series, University of Texas at Austin, Austin, TX, USA

Relational Program Synthesis

11/2018 OOPSLA, Boston, MA, USA

Program Synthesis using Abstraction Refinement

01/2018 POPL, Los Angeles, CA, USA

Synthesis of Data Completion Scripts using Finite Tree Automata

11/2017 OOPSLA, Vancouver, Canada

FIDEX: Filtering Spreadsheet Data using Examples

11/2016 OOPSLA, Amsterdam, Netherlands

An Algorithm for Learning Regular Expressions From Examples

11/2016 Microsoft Research, Redmond, WA, USA