Jingbo Wang

Curriculum Vitae

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Research Interests

My research is at the intersection of **software engineering** and **formal methods**, with an emphasis on developing rigorous *verification, analysis* and *program synthesis* techniques to improve the security, robustness, and fairness of critical software systems.

Education

Aug 2017 – Aug 2023	**University of Southern California** Los Angeles, CA. Ph.D. in Computer Science Advisor: Chao Wang
Aug 2013 – Jun 2017	**Huazhong University of Science and Technology** Wuhan, China. Bachelor of Science in Computer Science

Research & Industry Experience

Aug 2024 –	**Assistant Profesor**. Purdue University
Sep 2023 – Jul 2024	**Postdoctoral Researcher**. The University of Texas at Austin Advisor: Prof. Isil Dillig
Aug 2017 – Aug 2023	**Graduate Research Assistant**. University of Southern California Advisor: Prof. Chao Wang
May 2022 – Aug 2022	**Applied Scientist Intern**. Amazon, CodeGuru Team Scale taint analysis to the entire codebase. Mentors: Dr. Michael Emmi and Dr. Liana Hadarean
May 2018	**Eighth Summer School on Formal Techniques**. SRI Computer Science Laboratory Organizer: Dr. Natarajan Shankar

Honors & Awards

2023	**Distinguished Paper Award of PLDI 2023**
2021	**MIT EECS Rising Star** Awarded to ∼50 women graduate students in electrical engineering and computer science
2021	**WiSE Merit Award** 2 recipients in Viterbi School of Engineering of USC

2019 **Selected Young Reseacher of the 7th Heidelberg Laureate Forum**

2019 **Selected Attendee of CRA-W Grad Cohort for Women Workshop**

2019 **VMW Scholarship** *CAV'19*

2019 **PLMW Scholarship** *PLDI'19*

2016 **Finalist at Student Clustering Competition (SC'16)**

2016 **Highest LINPACK award at ISC-HPCAC Student Cluster Competition**

2016 **Champion at Asia Student Super Computer Challenge (ASC'16)**

Publications

2025 **C13: FairQuant: Certifying and Quantifying Fairness of Deep Neural Networks**
Brian Kim, **Jingbo Wang** and Chao Wang
47th International Conference on Software Engineering
(ICSE'25)

2023 **C12: Compositional Taint Analysis for Enforcing Security and Privacy**
Subarno Banerjee, Siwei Cui, Michael Emmi, Antonio Filieri, Liana Hadarean, Peixuan Li, Linghui Luo, Goran Piskachev, Nicolás Rosner, Aritra Sengupta, Omer Tripp, Sean Tout and **Jingbo Wang** (*alphabetical order*)
31st ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering Industry Track
(FSE'23)

2023 **C11: Systematic Testing of the Data-Poisoning Robustness of KNN**
Yannan Li, **Jingbo Wang** and Chao Wang
32nd ACM SIGSOFT International Symposium on Software Testing and Analysis
(ISSTA'23)

2023 **C10: Synthesizing MILP Constraints for Efficient and Robust Optimization**
Jingbo Wang, Aarti Gupta and Chao Wang
44th ACM SIGPLAN Conference on Programming Language Design and Implementation
(PLDI'23) 🏆 **Distinguished Paper Award**

2023 **C9: Certifying the Fairness of KNN in the Presence of Dataset Bias**
Yannan Li, **Jingbo Wang** and Chao Wang
35th International Conference on Computer Aided Verification (CAV'23)

2022 **C8: Synthesizing Fair Decision Trees via Iterative Constraint Solving**
Jingbo Wang, Yannan Li and Chao Wang
34th International Conference on Computer Aided Verification (CAV'22)

2022 **C7: Learning to Synthesize Relational Invariants**
Jingbo Wang and Chao Wang
37th IEEE/ACM International Conference on Automated Software Engineering (ASE'22)

2022 **C6: Proving Robustness of KNNs Against Adversarial Data Poisoning**
Yannan Li, **Jingbo Wang** and Chao Wang
22th International Conference on Formal Methods in Computer-Aided Design **(FMCAD'22)**

2021 **C5: Data-Driven Synthesis of Provably Sound Side Channel Analyses.**
Jingbo Wang, Chungha Sung, Mukund Raghothaman and Chao Wang
43rd International Conference on Software Engineering **(ICSE'21)**

2020 **C4: NeuroDiff: Scalable Differential Verification of Neural Networks using Fine-Grained Approximation**
Brandon Paulsen, **Jingbo Wang**, Jiawei Wang and Chao Wang
35th IEEE/ACM International Conference on Automated Software Engineering **(ASE'20)**

2020 **C3: ReluDiff: Differential Verification of Deep Neural Networks**
Brandon Paulsen, **Jingbo Wang** and Chao Wang
42nd International Conference on Software Engineering **(ICSE'20)**

2019 **C2: Mitigating Power Side Channels during Compilation**
Jingbo Wang, Chungha Sung and Chao Wang
27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering **(FSE'19)**

2019 **C1: Shield Synthesis for Real: Enforcing Safety in Cyber-physical Systems**
Meng Wu, **Jingbo Wang** and Chao Wang
19th International Conference on Formal Methods in Computer-Aided Design **(FMCAD'19)**

Under Review

2024 **U1: An Incremental Algorithm for Algebraic Program Analysis**
Chenyu Zhou, Yuzhou Fang, **Jingbo Wang**, and Chao Wang
In Submission

2024 **U2: Probabilistic Inference for Datalog Programs with Correlated Inputs**
Jingbo Wang, Shashin Halalingaiah, Weiyi Chen, Chao Wang and Isil Dillig
In Submission

Teaching Experience

2022 **University of Southern California** *2022* Fall
Teaching Assistant, CSCI 310 Software Engineering

2020 **University of Southern California** *2020* Spring
Teaching Assistant, CSCI 360 Introduction to Artificial Intelligence

2018 **University of Southern California** *2018* Fall
Teaching Assistant, CSCI 310 Software Engineering

Mentoring Experience

2024 **CAV Mentoring Workshop** *Montreal, 2024*
Organized the verification mentoring workshop (VMW) at CAV 2024

2022 **YOUNG RESEARCHERS PROGRAM** *Virtual, 2022*
Mentored a high school student *Estephany Dayana Arevalo* on science projects

2021-2022 **Mentoring Ph.D. students at USC**
Mentored Ph.D. students: *Yannan Li*, *Brian Kim*, *Michael Yuen*
Research Output: 1 FMCAD paper (*accepted*), 1 CAV paper (*accepted*), 1 ISSTA paper (*accepted*), 1 ICSE paper (*in submission*)

2021 **PLMW@PLDI** *Virtual, 2021*
Mentored junior Ph.D. students

2021 **Viterbi Graduate Mentorship Program** *Virtual, 2021*
Mentored MS students at USC.

Research Talks

2023 **Trustworthy Software Enabled by Program Analysis and Synthesis**
University of Toronto, Department of Electrical & Computer Engineering
Stanford University, Computer Science & Electrical Engineering Departments
UT Austin, Department of Computer Science

2023 **Systematic Testing of the Data-Poisoning Robustness of KNN**
ISSTA, Seattle, United States

2023 **Synthesizing MILP Constraints for Efficient and Robust Optimization**
PLDI, Orlando, United States

2023 **Trustworthy Software Enabled by Program Analysis and Synthesis**
Purdue University, Elmore Family School of Electrical and Computer Engineering
Purdue University, Department of Computer Science
North Carolina State University, Department of Computer Science
University of Virginia, Department of Computer Science
University of Waterloo, Cheriton School of Computer Science
UMass Amherst, Manning College of Information and Computer Sciences
Simon Fraser University, School of Computing Science
National University of Singapore, Department of Computer Science
Dartmouth College, Department of Computer Science
ETH Zürich, Department of Computer Science

2022 **Learning to Synthesize Relational Invariants**
ASE, Oakland Center, Michigan, United States

2022 **Synthesizing Fair Decision Trees via Iterative Constraint Solving**
CAV, The Technion, Haifa, Israel

2022 **Taint Analysis for Entire Version Sets**
Amazon, automated reasoning group

2021 **Data-Driven Synthesis of Provably Sound Side Channel Analyses**
National University of Singapore, PLSE Seminars
UC Berkely, 2021 (Simons Institute, talk given by my advisor Prof. Chao Wang)
ICSE, 2021, Virtual

2019 **Mitigating Power Side Channels during Compilation**
FSE, Estonia, 2019
USC, Guest Lecture at CSCI 310 *Software Engineering*

Services

Program Committee
- SPLASH 2024 SRC
- TACAS 2025
- ICSE 2025
- CAV 2024
- CAV VMW 2024 Organizer
- USENIX ATC 2024
- ASE 2024
- ISSTA 2024
- CAIN@ICSE2024
- VMCAI 2023 Artifact Evaluation Chair
- TACAS 2023 Artifact Evaluation
- ESEC/FSE 2023 Artifact Evaluation
- Fuzzing 2022 Artifact Evaluation
- SPLASH 2022 Student Research Competition
- PLDI 2022 Artifact Evaluation
- OSDI 2022 Artifact Evaluation
- ISSTA 2021 Artifact Evaluation

Journal Reviewer
- Communications of the ACM 2023
- ACM Transactions on Software Engineering and Methodology (TOSEM) 2023
- IEEE Transactions on Software Engineering (TSE) 2022
- ACM Transactions on Software Engineering and Methodology (TOSEM) 2022
- IEEE Design & Test 2019

External Reviewer
- 2020: ASE, DAC, FMCAD, ICSE
- 2019: ESEC/FSE, CAV, FMCAD, RV, ATVA, ICSE

Others
- USC PhD Women and gender minorities in Computing Club
- USC Women in Science and Engineering
- USC Software Research Seminar (Organizer)
- USC Academic Integrity Panel Reviewer

References

Chao Wang
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