

MINJIAN ZHANG

University of Illinois at Urbana-Champaign
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EDUCATION

University of Illinois at Urbana-Champaign

Ph.D. in Computer Science

2020 – Present

Advisor: Prof. Mahesh Viswanathan

Thesis deposited and defense completed; degree expected May 2026

University of Illinois at Urbana-Champaign

Bachelor of Science in Mathematics and Computer Science

2016 – 2020

RESEARCH INTERESTS

Formal methods and programming languages; Concurrency testing and verification; model checking and partial-order reduction; dynamic analysis and runtime verification; randomized algorithms for scalable bug detection; weak memory models; data race detection and predictive monitoring.

HONORS AND AWARDS

SIGPLAN Research Highlight

2024

CSF 2024 Distinguished Paper Award

2024

POPL 2023 ACM SIGPLAN Distinguished Paper Award

2023

EMPLOYMENT

Research Assistant, Siebel School of Computing and Data Science, University of Illinois at Urbana-Champaign

2020 – Present

Advisor: Prof. Mahesh Viswanathan. Research in formal methods, concurrency, and dynamic analysis.

Teaching Assistant, Siebel School of Computing and Data Science, University of Illinois at Urbana-Champaign

Fall 2020, Spring 2021, Fall

2025

Research Intern, School of Computing, National University of Singapore

May 2025 – June 2025

Advisor: Prof. Umang Mathur. Research on dynamic analysis and predictive monitoring for concurrent systems.

Research Intern, Max Planck Institute for Software Systems (MPI-SWS)

Aug. 2024 – Sept. 2024

Advisor: Prof. Rupak Majumdar. Research on state-space estimation for DPOR-based model checking.

Research Intern, School of Computing, National University of Singapore

Apr. 2023 – Jul. 2023

Advisor: Prof. Umang Mathur. Research on dynamic analysis and runtime verification for concurrent systems.

PUBLICATIONS

*My name is set in **bold** for readability. Equal contribution is indicated with a dagger (†), following the original publications. Some works list authors alphabetically; these are explicitly marked as authors listed alphabetically, and in such cases author order does not reflect contribution. For works with multiple primary authors (e.g., equal-contribution notes), all such co-primary authors are daggered.*

Submitted manuscripts

[1] **Dynamic Race Detection with $O(1)$ Samples** (journal version invited for reprint as a *Communications of the ACM* Research Highlight; under review).

Minjian Zhang[†], Mosaad Al Thokair[†], Umang Mathur, Mahesh Viswanathan

[2] **Stack-Aware Hyperproperties** (journal version under submission to *ACM Transactions on Computational Logic*).

Ali Bajwa[†], Minjian Zhang[†], Rohit Chadha, Mahesh Viswanathan

[3] **Predictive Monitoring against Alphabetical Pattern Constraints** (manuscript under review).

Jiahe Jiang, Minjian Zhang, Mahesh Viswanathan

[4] **Efficient Dynamic Algorithms to Predict Short Races** (manuscript under review).

Minjian Zhang, Mahesh Viswanathan

Peer-reviewed publications

[6] **State-Space Estimation for DPOR-based Model Checkers.**

ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2026).

A. R. Balasubramanian, Mohammad Hossein Khoshechin Jorshari, Rupak Majumdar, Umang Mathur, Minjian Zhang

[7] **Efficient Timestamping for Sampling-based Race Detection.**

ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2025).

Minjian Zhang, Daniel Lim, Mosaad Al Thokair, Umang Mathur, Mahesh Viswanathan

[8] **Deciding Branching-Time Hyperproperties for Timed Systems.**

IEEE Computer Security Foundations Symposium (CSF 2024).

Distinguished Paper Award.

Nabarun Denka[†], Minjian Zhang[†], Rohit Chadha, Mahesh Viswanathan

[9] **Dynamic Race Detection with $O(1)$ Samples.**

ACM SIGPLAN–SIGACT Symposium on Principles of Programming Languages (POPL 2023).

ACM SIGPLAN Distinguished Paper Award; SIGPLAN 2024 Research Highlight.

Mosaad Al Thokair[†], Minjian Zhang[†], Umang Mathur, Mahesh Viswanathan

[10] **Stack-Aware Hyperproperties.**

International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2023).

Ali Bajwa[†], Minjian Zhang[†], Rohit Chadha, Mahesh Viswanathan

[11] **Checking LTL[F,G,X] on Compressed Traces in Polynomial Time.**

ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2021).

Minjian Zhang, Umang Mathur, Mahesh Viswanathan

TEACHING EXPERIENCE

Teaching Assistant | Siebel School of Computing and Data Science, University of Illinois at Urbana-Champaign
Fall 2020, Spring 2021, Fall 2025

CS 357: Numerical Methods I (undergraduate numerical analysis). Duties included:

- Holding regular office hours and answering online student queries.

- Contributing to course design, including writing auto-graded homework and exam questions.
- Leading discussion sections and guiding students through problem-solving activities.

TALKS AND PRESENTATIONS

Efficient Timestamping for Sampling-based Race Detection *2025*
 Conference talk, ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI).

Sampling-based Race Detection *2025*
 Invited research seminar, School of Computing, National University of Singapore.

Dynamic Race Detection with $O(1)$ Samples *2023*
 Conference talk, ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL).

Security Hyperproperties for Recursive Systems *2023*
 Invited research seminar, School of Computing, National University of Singapore.

Checking LTL[F,G,X] on Compressed Traces in Polynomial Time *2021*
 Conference talk, ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE).

STUDENT SUPERVISION

Jiahe Jiang (M.C.S. in Computer Science, University of Illinois at Urbana-Champaign) *2024 – 2025*
 Research mentoring on topics in formal methods and predictive monitoring for concurrent systems.

Zixuan Fan (Undergraduate exchange student, Technical University of Munich) *2023*
 Research mentoring on reachability problems for higher-order pushdown systems.

PROFESSIONAL SERVICE

Paper reviewer: ACM/IEEE Symposium on Logic in Computer Science (LICS) 2022, IFIP International Conference on Formal Techniques for Distributed Objects, Components and Systems (FORTE) 2022, ACM Transactions on Computational Logic (ToCL) 2023, International Colloquium on Automata, Languages and Programming (ICALP) 2023, ACM SIGPLAN Symposium on Principles of Programming Languages (POPL) 2023, 2025.