

Yongwei Yuan

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Final year Ph.D. student in programming languages and formal methods looking for full-time positions in industry.

Education

Purdue University

PH.D. IN COMPUTER SCIENCE

West Lafayette, IN, USA

2020 - now (expected Aug 2025)

- Thesis: Trace-Guided Reasoning of Functional Programs (tentative)
- Selected Courses: Programming Languages | Compiling and Programming Systems | Neurosymbolic Program Synthesis

University of Michigan

B.S. IN COMPUTER SCIENCE

Ann Arbor, MI, USA

2018 - 2020

- Selected Courses: Operating System | Introduction to Machine Learning | Conversational Artificial Intelligence

Shanghai Jiao Tong University

B.S. IN ELECTRICAL AND COMPUTER ENGINEERING

Shanghai, China

2016 - 2020

Experience

Automated Reasoning Group @Amazon

Seattle, WA, USA

APPLIED SCIENTIST INTERN

Summer 2023

- Devised and implemented algorithmic optimization for policy evaluation in Identity and Access Management (1 billion calls per second).
- Profiled the policy evaluation engine, discovered multiple unusual patterns, and turned them into optimization opportunities.
- Proved the correctness of all these optimizations in Dafny and improved the performance of the policy evaluation engine by about 10%.

APPLIED SCIENTIST INTERN

Summer 2022

- Proved the correctness of IP address parsing in Dafny, which is a critical component of Identity and Access Management.
- Identified Dafny's limitation in bitvector reasoning and devised an effective workaround for it, enabling sound analysis of IP addresses.
- Implemented a Dafny-to-Java transpilation pass to generate idiomatic bitvector manipulation code.
- Adopted the Checker Framework to enable various safety checks in the generated Java code, providing future proof to developers.

Purdue University

West Lafayette, IN, USA

GRADUATE RESEARCH ASSISTANT

2023 - now

- Under the supervision of Dr. Suresh Jagannathan.

GRADUATE RESEARCH ASSISTANT

2020 - 2023

- Under the supervision of Dr. Roopsha Samanta.

Honors and Awards

- Merit Recognition Award 2024, Purdue University
- OOPSLA 2023 Distinguished Paper Award, ACM SIGPLAN
- PLDI 2023 Distinguished Paper Award, ACM SIGPLAN
- Honorable Mention, Mathematical Contest in Modeling 2017

Publications

- [1] Guannan Wei, Danning Xie, Wuqi Zhang, Yongwei Yuan, and Zhuo Zhang. 2024. Consolidating Smart Contracts with Behavioral Contracts. *Proc. ACM Program. Lang.* 8, PLDI (June 2024), 965–989. <https://doi.org/10.1145/3656416>
- [2] Yongwei Yuan, Scott Guest, Eric Griffis, Hannah Potter, David Moon, and Cyrus Omar. 2023. Live Pattern Matching with Typed Holes. *Proceedings of the ACM on Programming Languages* 7, OOPSLA1 (April 2023), 609–635. <https://doi.org/10.1145/3586048>
- [3] Yongwei Yuan, Arjun Radhakrishna, and Roopsha Samanta. 2023. Trace-Guided Inductive Synthesis of Recursive Functional Programs. *Proceedings of the ACM on Programming Languages* 7, PLDI (June 2023), 860–883. <https://doi.org/10.1145/3591255>
- [4] Yongwei Yuan, Zhe Zhou, Julia Belyakova, and Suresh Jagannathan. 2025. Derivative-Guided Symbolic Execution. *Proceedings of the ACM on Programming Languages* POPL (Conditional Acceptance) (January 2025).

Services

- PLDI 2024 Artifact Evaluation Committee

Skills

Programming OCaml | C / C++ | F# | Scala | Haskell | Python | TypeScript
Formal Methods Dafny | Z3 | Coq | Lean | LLVM