Zhengyao Lin

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Education

Carnegie Mellon University — Pittsburgh, PA, USA
Ph.D. in Computer Science — August 2022 - Present
Advisor: Bryan Parno

University of Illinois at Urbana-Champaign — Champaign, IL, USA
B.S. in Mathematics and Computer Science (Highest Distinction) — August 2018 - May 2022
GPA: 3.98 / 4.00

Publications

A Formally Verified Compilation Framework for Asynchronous Dataflow.
Zhengyao Lin, Yi Cai, Milijana Surbatovich. In submission.

Cazamariposas: Automated Instability Debugging in SMT-based Program Verification.
Yi Zhou, Amar Shah, **Zhengyao Lin**, Marijn Heule, Bryan Parno. International Conference on Automated Deduction (**CADE**) 2025.

Towards Practical, End-to-End Formally Verified X.509 Certificate Validators with Verdict.
Zhengyao Lin, Michael McLoughlin, Pratap Singh, Rory Brennan-Jones, Paul Hitchcox, Joshua Gancher, Bryan Parno. USENIX 2025.

Vest: Verified, Secure, High-Performance Parsing and Serialization for Rust.
Yi Cai, Pratap Singh, **Zhengyao Lin**, Jay Bosamiya, Joshua Gancher, Milijana Surbatovich, Bryan Parno. USENIX 2025.

FlowCert: Translation Validation for Asynchronous Dataflow via Dynamic Fractional Permissions.
Zhengyao Lin, Joshua Gancher, Bryan Parno. Proceedings of the ACM on Programming Languages (**OOPSLA**) 2024.

Generating Proof Certificates for a Language-Agnostic Deductive Program Verifier.
Zhengyao Lin, Xiaohong Chen, Minh-Thai Trinh, John Wang, Grigore Roşu. Proceedings of the ACM on Programming Languages (**OOPSLA**) 2023.

Synthesizing Axiomatizations using Logic Learning.
Paul Krogmeier*, **Zhengyao Lin***, Adithya Murali*, P. Madhusudan. Proceedings of the ACM on Programming Languages (**OOPSLA**) 2022.

Towards a Trustworthy Semantics-Based Language Framework via Proof Generation.
Xiaohong Chen, **Zhengyao Lin**, Minh-Thai Trinh, Grigore Roşu. International Conference on Computer-Aided Verification (**CAV**) 2021.

Language-Parametric Compiler Validation with Application to LLVM.
Theodoros Kasampalis, Daejun Park, **Zhengyao Lin**, Vikram Adve, Grigore Roşu. ACM International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**) 2021.

Research Experience

Carnegie Mellon University, *Research Assistant* — August 2022 - Present
Formal verification for spatial dataflow architectures, advised by Prof. Bryan Parno.

Amazon Web Services, *Applied Scientist Intern*   May 2025 - August 2025

Contributed to soundness and completeness proofs of Cedar's symbolic compiler (SymCC) in Lean; coverage-guided automated test generation for Cedar policies.

Intel Labs, *Research Intern*   June 2023 - August 2023

Verification for a lowering pass in a fully homomorphic encryption compiler.

Formal Systems Lab at UIUC, *Research Assistant*   August 2020 - August 2022

Proof generation for the $\mathbb{K}$ framework, advised by Dr. Xiaohong Chen and Prof. Grigore Roşu.

University of Illinois, *Research Assistant*   June 2021 - August 2022

Lemma and axiom synthesis for first-order logic with least fixpoints and modal logics, advised by Prof. Madhusudan Parthasarathy.

LLVM Group at UIUC, *Research Assistant*   January 2020 - August 2021

Language-parametric translation validation for LLVM, advised by Prof. Vikram Adve.

Illinois Geometry Lab at UIUC, *Research Assistant*   August 2020 - December 2020

Visualizing Büchi-automatic fractals and working on a decision procedure for an extension of Presburger arithmetic, advised by Prof. Philipp Hieronymi.

Teaching Experience

- TA for CS 426 Compiler Construction (UIUC)   Fall 2021
- TA for CS 473 Algorithms (UIUC)   Spring 2020
- TA for CS 241 System Programming (UIUC)   Spring 2019 - Spring 2020

Service and Professional Experience

- **CAV 2021**, Student Volunteer
- **Runtime Verification**, Software Engineer Intern   Summer 2021
- **Facebook**, Software Engineer Intern   Summer 2020
- **Cloudflare**, Software Engineer Intern   Summer 2019

Awards

- UIUC Bronze Tablet Award (top 3% in the graduating class)   May 2022
- CRA Outstanding Undergraduate Researcher Award, Honorable Mention   January 2022
- UIUC Most Outstanding Major Award in Mathematics and Computer Science   February 2020
- UIUC Dean's List   2018 - 2021