

Michael Zhang

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EDUCATION

Cornell University

B.A. Computer Science

Ithaca, NY

Aug. 2024 — expected May 2028

- **Cumulative GPA:** 4.04
- **Relevant Coursework:** Formal Verification, Program Synthesis, Computer Architecture, Mathematical Logic

EXPERIENCE

Research Assistant

Computer Architecture & Programming Abstractions Lab (Capra) — Cornell University

Jan. 2026 — present

Ithaca, NY

- **Mentors:** Kevin Laeuffer and Adrian Sampson
- Implement the Property-Directed Reachability (PDR; [Een et al.](#)) model-checking algorithm in Rust for the **Patronus** hardware verification toolkit
- Add UNSAT core generalization for blocked counterexamples-to-induction (CTIs), achieving ~13.5x speedup over the vanilla PDR implementation and increasing [HWMCC '25](#) benchmarks solved from 2 to 20 (1 core, 16 GB, 5 min. timeout)
- Validate against Stanford's [Pono](#) IC3Bits model-checking engine with no disagreements, demonstrating the soundness of the PDR implementation
- Design counterexample extraction mechanism, emitting concrete traces for property violations

Teaching Assistant, CS 3410: Computer System Organization and Programming

Cornell University

Aug. 2025 — May 2026

Ithaca, NY

- Led lab section, including lectures and programming activities
- 5.0/5.0 overall rating on student-submitted teaching assistant evaluations

Intern

ZBeats Inc.

Jan. 2025 — Aug. 2025

Stony Brook, NY

- Built a three-node Proxmox VE high-availability cluster, cutting monthly compute costs by \$2k+ and accelerating ML training by 30%; added a VPN server for client access control and authored sysadmin documentation
- Reverse-engineered .NET/MSVC conversion logic from a vendor ECG utility (Sigknow Biomedical) and integrated it into the production AWS pipeline, reducing conversion errors by 20%
- Built a shipping API in Java/Spring Boot for medical device logistics in the company web portal

PROJECTS

Lead, *OJeopardy!* (github.com/michael-zhang-lambda/ojeopardy-public)

Oct. 2025 — Dec. 2025

- Developed server-client concurrency model for a multiplayer command-line *Jeopardy!* game that enforces loose coupling between backend game engine and frontend interface, while ensuring synchronization between backend and clients
- Implemented a GraphQL server in OCaml to support game logic and real-time multiplayer gameplay
- Led project planning sessions, delegated tasks to team members, and reviewed pull requests for style and correctness

Contributor, Quad-core Fully Pipelined RISC-V Processor

Aug. 2025 — Dec. 2025

- Developed control logic for pipelined cores and cache in SystemVerilog RTL
- Wrote C programs to test and benchmark final design
- Verified design with PyMTL unit testing and GTKWave waveform viewer

SKILLS

- **Programming Languages:** Rust, C, C++, OCaml, Java, Python, TypeScript, RISC-V Assembly, Verilog/SystemVerilog
- **Verification:** Rocq (Coq), Lean, Bitwuzla, Z3, CVC5, Yices
- **Tools:** Git, Jujutsu, Unix/Linux, Nix, Docker, AWS
- **Human Languages:** English (native), Mandarin Chinese (fluent)