Francis Pham

fpham0701 | francispham- | fdp25@cornell.com | fpham0701.github.io | +1(267) 673-5032

Education

Cornell University — Ithaca, NY

B.S. Electrical & Computer Engineering, Computer Science - GPA: 3.82/4.0 — Aug 2022 – Dec 2025

M.Eng Computer Science – Early Admit — Aug 2025 – May 2026

Relevant Coursework (* Fall 2025): Analysis of Algorithms, Computer Architecture, Distributed Systems*, High-Level Digital Design Automation, Object-Oriented Programming & Data Structures, Cloud Computing*, Operating Systems, Embedded Systems, Digital Logic & Computer Organization, Programming Languages*, Functional Programming, Software Testing*, Discrete Math, Foundations of Robotics*, Data Science, Probability, VLSI Digital Design

Experience

NVIDIA — Santa Clara, CA

Software Engineering Intern — May 2025 – Aug 2025

- Built and deployed a LLM-based coverage-guided fuzzer using Google's Centipede to accelerate finding bugs in compilers
- Exposed 12 compiler crashes for NVVM Dialect while increasing coverage by 11%, strengthening compiler reliability
- Generalized the fuzzer to be language-agnostic, enabling reuse across compiler components for minimal integration effort

NVIDIA — Santa Clara, CA

Software Engineering Intern — May 2024 – Aug 2024

- Implemented and maintained an automated testing pipeline using internal framework to streamline the verification process for NVVM Dialect of MLIR and collect performance metrics to provide reports/regressions to stakeholders
- Spearheaded a test generation pipeline for dialect translation, utilizing LLVM/MLIR APIs for increase coverage
- Enhanced the robustness of internal MLIR testing framework, reducing manual testing efforts for verification team

Capra Research Lab — Ithaca, NY

Research Assistant — Sep 2024 – Present

- Designing a Rust-based hardware verification language to model cycle-accurate RTL through a UVM driver interface
- Implemented the language IR, including a modular serialization layer to enable frontend to backend translation
- Developed a static type system and type inference for the IR to enforce timing/protocol correctness before simulation
- Integrated diagnostics framework for error-handling, notably improving developer feedback and reducing debug time

Cornell University Unmanned Air Systems – CUAir — Ithaca, NY

Imaging Systems Member — October 2022 – Present

- Collaborated with a team of 50+ to design and produce a vertical take-off and landing autonomous aircraft, with concerns for optimizing weight reduction, aerodynamic features, and mission functions for annual competition
- Built an interface to interact with system camera to asynchronously capture images for airdrop target detection
- Programmed functionality for internal recruitment portal to ease recruitment process efforts and increase efficiency

Projects

Accelerated Bitcoin Mining Simulation | *C++, Vivado HLS, Git* — Oct 2024 – Dec 2024

- Optimized a SHA-256 simulation to achieve speedup of 6.7x on FPGA through loop tiling/unrolling and array partition
- Debugged using waveform analysis tools, examining timing issues and data dependencies to validate hashing algorithm

TinyRISC-V Multi-Core Processor | *Verilog, Python, PyMTL3, Git* — Sept 2024 – Dec 2024

- Built a variable-latency multiplier and fully-bypassed pipelined 5-stage CPU, cutting multiplier cycles 2.2x and CPI 1.5x
- Created direct mapped (write-back/allocate) and 2-way set associative caches (LRU), analyzing performance trade-offs

Involvement

- **Teaching Assistant for ECE 2100: Circuits (FA23, SP24, FA24)**: Held weekly office hours, assisting with circuit analysis concepts for problem sets, lab reports, and exams. Oversaw biweekly labs on breadboard circuit design and led a section for over 40 students. Delegated grading tasks and roles for the TA team. Graded assignments for a class of 100.
- **Teaching Assistant for ECE 4750: Computer Architecture (FA25)**: Oversaw weekly office hours to help debug a class of 80 students' lab assignments and assisted with computer architecture concepts and problem solving.

Skills

Languages: Python, C/C++, Verilog, Rust, Javascript, Shell Script, OCaml
Technologies: Git/Github, Linux, Docker, Asynchronous Programming, Quartus, Cadence, LTSpice, MLIR, LLVM