

EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) JUNE 2023

Master of Engineering in Electrical Engineering and Computer Science, Computer Systems Concentration (5.0/5.0 GPA)

- For thesis research with MIT PDOS, designed a new C- and WebAssembly-based toolchain for privilege separation and used it to implement a security key w/ three privilege domains that isolate bug-prone code from cryptographic secrets.
- Awarded the Frederick C. Hennie III Award for Excellence in Teaching as the only TA for the new Fundamentals of Computer Security, for which I developed programming labs, wrote a course reader, and taught students directly.
- Iterated on and helped students learn from programming labs as a TA for 6.858 Computer Systems Security (grad-level).

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) MAY 2022

Bachelor of Science in Electrical Engineering and Computer Science. Minor in Urban Studies & Planning. (5.0/5.0 GPA)

- Exciting coursework included a Raft-based sharded key/value store in Go (6.5840/6.824 Distributed Systems), an optimizing compiler in Rust (6.035 Computer Language Eng.), implementation and comparison of CPU branch predictor designs (6.823 Computer System Architecture), a hardware password manager (6.115 Microcomputer Project Lab.), and GIS analyses of Boston BlueBikes and bus network demand patterns (11.001 Intro. to Urban Design).
- Developed and taught lessons in physics, math, and computer science to Italian students in Global Teaching Labs.
- Maintained & improved thetech.com + CMS as Tech Director and Staff Photographer at student newspaper The Tech.

EXPERIENCE

SEMGREP - SENIOR SOFTWARE ENGINEER SUMMER 2022, AUG. 2023-PRESENT

- Shortly after joining the supply chain team, designed and delivered the company's top priority project, starting with a redesign to satisfy new requirements. Met directly with key customers to identify the minimal scope that would allow us to ship and validate our approach. The redesigned framework is now the foundation of the Supply Chain product.
- Owned majority of backend work in a new fine-grained authorization system based on Google Zanzibar and led the 5-engineer team through a month-long milestone. The system is now on the critical path of every Flask backend request.
- Refactored database transaction model across our Flask backend to transition from implicit database transactions to autocommit; built an intuitive SQLAlchemy API for explicit transaction usage as well as database monitoring tools.
- Recognized by company leadership for high-impact work with a "founder's grant" and an engineering-wide award.
- Advocated for improvement in team decision-making processes, leading to adoption of a new decision doc format.
- Embraced unfamiliar domains; became a company expert on DB concurrency and Mypy and a team expert on OCaml.

APPLE, INC. - CELLULAR FIRMWARE ENGINEERING INTERN JUNE-AUG. 2021

- Prototyped Python & C software and hardware test framework to improve interdepartmental integration testing.
- Published extensive documentation internally and held training sessions to transition development to full-time engineers.

KEOLIS COMMUTER SERVICES - FULL STACK ENGINEERING INTERN JUNE-AUG. 2020

- Built a distributed real-time location tracking and engine telemetry processing system for MBTA locomotives.
- Implemented algorithms for onboard data processing on each locomotive, handling 10x/sec updates over unreliable cellular links without data loss. Presented live & historical fleet data in a custom React-based dashboard.

PROJECTS

LITTLEFIXES.XYZ WINTER 2024

- Built a geospatial forum to foster discussion of urban micro-improvements, inspired by oversights I noticed in my city.
- Implemented with Rust (Axum) and SvelteKit; used PostGIS for spatial querying and Leaflet for map UI.

IMESSAGE BOOK SPRING 2024

- Harvested and formatted complete messaging history with my partner from my phone's SQLite database w/ Rust and printed 3 paperbacks. Popular on Hacker News; someone emailed that they made an anniversary present with my code!

SKILLS

- **Languages & Technologies:** Python (Flask, SQLAlchemy), TypeScript (React, Svelte), Go, OCaml, Rust, C, Verilog
- **Infrastructure:** Kubernetes, Postgres & PostGIS, AWS (S3, EC2, RDS), Docker Compose, ArgoCD, Github Actions