

Gabriel Sha

Pittsburgh, PA

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Education

Carnegie Mellon University

August 2022 – May 2026

Bachelor of Science in Information Systems, Additional Major in Computer Science

Pittsburgh, PA

- Academic Distinctions: Dean's List High Honors
- Relevant Coursework: Data Structures/Algorithms, Functional Programming, Web Application Design/Development, Database Design, Discrete Math, Linear Algebra, Computer Systems, Distributed Systems

Technical Skills

Languages: Python, C, Go, HTML/CSS, JavaScript, SQL, Standard ML, Ruby, R, x86 ASM

Tools/Frameworks: Git, Figma, Jupyter Notebook, MongoDB, GDB, React, Rails, Flask

Experience

Cybersecurity Engineer Intern

May 2024 – August 2024

Software Engineering Institute

Pittsburgh, PA

- Co-developed `IIDES`, helping design schema, write scripts to automate file translation, and build sample data.
- Constructed `pyIIDES`, a Python package aimed to support `IIDES` with vocabulary and relationship validation.
- Engineered a Flask-based web application utilizing RESTful architecture and built-in `pyIIDES` relationship/vocabulary validation, providing researchers with a tool to quickly translate, visualize, and edit dozens of datasets.
- Presented data analysis package to SEI researchers, effectively communicating technical architecture, application use cases, and a strategic roadmap for future use.

15-112 Teaching Assistant

August 2024 – Current

Carnegie Mellon University School of Computer Science

Pittsburgh, PA

- Led recitations (30 students) and tutor sessions (5 students) each week consisting of CS concepts ranging from conditionals and loops to recursion, backtracking, and OOP, offering helpful explanations to variety of questions.
- Communicated with 50 teaching assistants to support over 600 students with office hours, one-on-ones, and small group.
- Mentored 12 students throughout a 2 week, approximately 1000 line Python term project at the end of the semester.

Undergraduate Research Assistant

July 2023 – August 2023

Carnegie Mellon University Philosophy Department

Pittsburgh, PA

- Engineered process leveraging OpenAI's GPT-4 to fix grammatical errors, anonymize interview members, and summarize poorly worded answers, reducing manual workload of researchers by over 90%.
- Collaborated with Professor Cullen to build an educational debate chatbot for an intro to Philosophy course using OpenAI, enhancing critical thinking skills and promoting bias-free learning about complex social issues.

Projects

Distributed Bitcoin Miner | Go

- Built a custom Live Sequence Protocol (LSP) over UDP to ensure message integrity and ordering, using techniques like sliding window, epoch timeouts, and exponential backoff for packet reliability.
- Developed fault-tolerant distributed Bitcoin mining system that dynamically assigns tasks to clients, efficiently reassigning jobs on worker failures to maintain high resilience and processing speed even under network stress.
- Designed a load-balancing algorithm to fairly distribute work across miners, minimizing response times and ensuring requests are completed in a fair, efficient order.

Concurrent Proxy | C

- Programmed a multithreaded HTTP proxy server capable of handling multiple concurrent client connections using POSIX threads, enabling efficient request and response forwarding for HTTP/1.0 GET operations.
- Devised robust request parsing and error handling, including custom HTTP parser integration and validation mechanisms to ensure proper communication between clients and servers.

Criminal Incident System | Ruby on Rails, SQLite, HTML/CSS, ReactJS

- Created a full-stack, multi-user web application for quick access to criminal/officer data in a simulated crime database.
- Implemented and documented 12 REST API endpoints with token authentication, authorization, and versioning.
- Engaged in test-driven development, writing comprehensive units tests for 10 models with 100% test coverage.