

Skills

- **Languages:** C++, C, Java, Python, SQL, TypeScript, R, Rust.
- **Frameworks & Libraries:** FastAPI, Pandas, NumPy, React, Scikit-Learn, LightGBM, SQLAlchemy.
- **Systems & Tools:** Linux, Git, Docker, AWS, Kubernetes, Jupyter Notebook.

Project Experience

Perturbation Flakiness Testing

Feb 2026 – Apr 2026

- Built a **Python-based flaky test detection** tool for pytest suites, using environment perturbations to expose **non-deterministic failures** caused by timing, test order, randomness, and resource pressure.
- Designed automated test execution workflows with **Docker, scripts**, and structured result analysis to improve reproducibility and support reliability-focused debugging.
- Organized the project with modular **source code, tests, documentation**, and **development tooling** to demonstrate production-style software engineering practices.

AI Security Operations Platform

Dec 2025 – Feb 2026

- Architected a modular SOC backend using **FastAPI** and **PostgreSQL** to ingest and classify security events across 3 attack categories, enabling structured alert generation with full audit traceability.
- Built a deterministic risk scoring engine in **Python** that analyzes behavioral signals (failed logins, attack spread) and assigns confidence-weighted triage decisions with recorded rationale — ensuring fully explainable results over black-box outputs.
- Implemented a **human-in-the-loop approval** workflow where every recommended action requires explicit analyst sign-off before execution, preventing security actions from being executed without analyst review.

POSIX Mini Shell

Oct 2025 – Dec 2025

- Implemented a Unix-like shell in **C/C++** using **POSIX system** calls, supporting command execution, foreground/background processes, command history, and signal handling.
- Applied process control concepts including **fork/exec, wait handling**, and zombie process cleanup to improve reliability and match expected shell behavior.
- Added structured testing with **Google Test** to **validate** command parsing, built-in commands, and core shell functionality.

TCP Group Chat Fuzzer

Oct 2025 – Dec 2025

- Built a multi-client TCP chat server in C using POSIX sockets and pthreads, supporting concurrent client connections, message broadcasting, and coordinated shutdown.
- Designed a custom binary message protocol with robust network I/O handling to manage partial reads, malformed packets, and client disconnects.
- Implemented fuzzing clients to test server reliability against unexpected inputs and unstable network behavior.

Multithreaded MapReduce

Oct 2025 – Dec 2025

- Implemented a lightweight MapReduce runtime in **C** using **POSIX threads**, configurable **mapper/reducer workers**, and **synchronized shared data structures**.
- Designed deterministic partitioning and **thread-safe aggregation** to support parallel word-count style workloads.
- Added **correctness tests** for mapper behavior, reducer behavior, partition validation, and end-to-end MapReduce execution.

Fraud Detection – ML Hackathon (Team: Mind Over Models)

Feb 2026

- Built a multi-class fraud classifier using **LightGBM** on a heavily imbalanced dataset, iterating across multiple models and feature engineering approaches to achieve a final accuracy of **99.89%**.
- Engineered features in Pandas — transaction velocity, merchant risk scoring, and time-of-day patterns — to surface fraud signals invisible to generic models and improve precision on minority fraud classes.

Zombieland

Dec 2024 – Jan 2025

- Designed a complete 2D maze game in **Java** with player mechanics, collectibles, barriers, and poison tiles — structured with **OOP** design patterns to keep game entities independently testable and extensible.
- Implemented two AI-controlled zombie enemies using **pathfinding algorithms** to dynamically track and intercept the player, delivering progressively increasing difficulty.
- Delivered a production-quality codebase with a **Maven** build pipeline, full Javadoc documentation, and unit test coverage — demonstrating a complete development lifecycle from design through artifact.

Emergency Report System – Group Project (CMPT 272)

Aug – Dec 2024

- Built a real-time emergency reporting web app using **Leaflet.js** and **OpenStreetMap**, enabling civilians to submit geotagged incident reports and first responders to filter and track live incidents on a map.
- Implemented client-side encryption with **CryptoJS** and DOM-based data persistence to ship a fully secure, functional app with no backend dependency, cutting infrastructure complexity while maintaining integrity.

Volunteer Experience

International Exchange Consultant

Jan 2025 – Dec 2025

AIESEC in SFU, Canada

- Advised **20+ exchange participants** on visa processes, travel logistics, and cultural adaptation, maintaining communication with global AIESEC partners to ensure smooth program delivery.

Peer Educator

Jan – Sep 2023

Fraser International College, Canada

- Provided academic tutoring in **C++**, **Python**, and **Mathematics** to fellow students, mentored new international students on university transition, campus navigation, and academic planning.

Education

Bachelor of Science in Computing Science, Minor in Mathematics

Sep 2022 - Present

Simon Fraser University, Canada