

Mithun Selvananthan

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Education

McMaster University

Bachelors in Systems Engineering

Expected Graduation, May 2027

Hamilton, ON

Technical Skills

Languages: Python, C++, JavaScript, TypeScript, SQL, Swift (iOS), HTML, CSS

Tools/Frameworks: Linux, GitHub, Docker, AWS, FastAPI, React, Flutter

Experience

Canadian Sheep Federation

June 2026 – Present

Software Engineering Intern

- Caught a critical data-corruption bug and a plaintext credential leak before production by reviewing a 175-file MongoDB-to-PostgreSQL migration (Node.js, Sequelize).
- Built an automated regression testing framework from scratch (Jest, Supertest, Playwright), taking the codebase to 340+ passing tests across 27 suites, and integrated it into CI via GitHub Actions.
- Shipped a zero-downtime backend deployment to a production Azure VM, systemd auto-restart, Nginx reverse proxy, with crash recovery verified in under 5 seconds.

De Havilland Aircraft of Canada Limited

August 2025 – April 2026

Software Automation Intern

- Identified bottlenecks in quality reporting workflows across 3 active aircraft manufacturing programs by auditing how production data moved from Epicor ERP through to engineering teams, then built Python ETL pipelines to fix the gaps.
- Eliminated 6 hours/week of manual aggregation for 7 stakeholders by independently scoping, building, and deploying automated reporting infrastructure in Python and Excel with no spec given, problem found and solved autonomously.
- Designed and shipped Power BI dashboards with Python pre-processing to surface inspection KPIs and throughput in real time, accelerating issue escalation across quality engineering workflows.

Projects

TCP Load Balancer | C++17, Linux, Docker, epoll, POSIX Sockets

- Built a TCP load balancer in C++17 with epoll event loop, thread pool, and connection pooling, benchmarked at 9,600 req/sec with zero errors under concurrent load testing.
- Implemented round-robin and least-connections routing using lock-free atomics and mutex synchronization; deployed on Linux via Docker with cross-platform epoll/select support.
- Designed connection pool with lazy acquisition, health checking, and TCP half-close handling, mirroring the architecture of HAProxy and PgBouncer.

BlindSpot - AI Navigation Assistant for the Visually Impaired | Flutter, Python, YOLOv8, Gemini 2.5 Flash

- **2× Award Winner at GDG Mac-A-Thon**
- Architected a real-time AI navigation app for visually impaired users using Flutter, LiveKit WebRTC, and Python, streaming GPS, camera, haptic, and audio data across five typed channels to a server-side inference pipeline.
- Achieved sub-400ms obstacle detection by compressing camera frames from BGRA to JPEG under 10KB and running YOLOv8n ONNX inference server-side within LiveKit's strict 14KB channel constraint.
- Delivered context-aware turn-by-turn voice guidance using Gemini 2.5 Flash with persistent conversation history and dual-threshold proximity alerts at 45m and 12m from detected obstacles.

CI/CD Failure Triage Agent | Python, Cerebras, ChromaDB, FastMCP, GitHub API

- Built an AI-powered CI/CD failure triage agent using Cerebras LLM inference and ChromaDB vector search, scraping real GitHub Actions failure logs, classifying failure types, and generating root cause analysis with confidence scores.
- Designed a modular 5-stage RAG pipeline (scrape → clean → chunk → embed → retrieve+generate) processing logs from 8 open-source repos into 3,829 embeddings stored in a persistent HNSW cosine index; 68 automated tests across all pipeline stages with zero live API dependencies.
- Exposed the triage agent as a native Claude Code tool via FastMCP (stdio transport), enabling engineers to invoke root cause analysis directly from their IDE against any failing CI/CD log.