

EDUCATION

Simon Fraser University • BSc. Data Science

- Expected transfer into BSc. Mathematics and Computer Science
- Horatio Alger Canadian Scholar
- Schulich Leader Scholarship Nominee

Expected Graduation June 2028

EXPERIENCE

SFU Autonomous Intelligence and Robotics Lab • Research Software Engineer

November 2025 – Present

- Engineered and stabilized a distributed UAV software architecture spanning embedded UART subsystems, IP-networked telemetry paths, and ROS middleware.
- Configured MLink-ESP Wi-Fi modules via low-level AT-command protocols and refactoring C++ bridging layers to restore deterministic command/telemetry flow.
- Developed and operated a containerized ROS Noetic robotics toolchain using Docker (host networking, X11/Qt forwarding, and hardware passthrough), resolving low-level Linux graphics and runtime interface failures in robotics visualization workflows.
- Implemented production-grade robotics workflows using catkin build systems, ROS node orchestration, and tmux-driven parallel runtime environments.

Simon Fraser University Rocketry • GNC Software Engineer

November 2025 – Present

- Designing an MPC architecture in MATLAB for trajectory optimization using an augmented Lagrangian iLQR.

National Research Council Canada • Software Engineer Intern

June 2025 – August 2025

- Architected and implemented a high-performance, real-time C++ embedded control system for autonomous sensing and diagnostics, achieving deterministic execution and rigorous fault tolerance.
- Reduced program size by 51% and flash writes by 44% under less than 33 KB memory constraints.
- Developed low-level firmware for Renesas RA4M1 and ATmega328P-class MCUs, interfacing sensor arrays over I2C and validating deterministic timing behavior.
- Designed a novel state-transition algorithm using high-invariant C++ template metaprogramming, enabling function-pointer-driven conditional execution within a serial data verification pipeline.
- Implemented an acquisition pipeline coordinating sensor sampling, signal processing, and actuation scheduling with predictable latency characteristics.
- Collaborated within a multidisciplinary engineering team in an access-controlled R&D environment, delivering production-quality software under strict reliability requirements.

Advanced Materials and Process Engineering Laboratory • Software Research Intern

July 2025

- Analyzed and tested software for electrochemical instrumentation and optimized telemetry data during a one day visit at AMPEL.

PROJECTS

Prism 01 – Photonic Diffractometer • github.com/shaneso/prism

September 2025 – Present

- Building a Bragg diffraction analyzer to probe the structure and periodicity of optical computing substrates.

Juggle Buddy – CV Kinematics Trainer • github.com/shaneso/juggle_buddy

January 2026

- Engineered a real-time OpenCV + YOLO inference pipeline integrating HSV color-space calibration for robust object segmentation under variable lighting and camera conditions; built at [nwHacks 2026](#).
- Developed deterministic unit and integration tests with PyTest covering vision transforms, scaling invariants, and comparator logic.

Lux – Biomedical Compute Engine • github.com/shaneso/lux

January 2025 – May 2025

- Developed a cross-platform application in TypeScript with a custom-routed React Native interface to model tumor data.
- Architected a production-grade cross-platform computation workflow, exposing the engine over a RESTful API with JSON-based configuration, version control metadata, and structured execution logs.
- Deployed iterative builds via Expo/EAS with external beta testing, achieving optimized shipping times.

Omni – Cryptographic Medical Ledger • github.com/shaneso/omni

May 2024 – October 2024

- Engineered a C++ cryptographic ledger system using SHA3-256 hashing and deterministic node-addressing abstractions to ensure secure, tamper-resistant data storage and retrieval.
- Developed modular encapsulated components to enforce data integrity, immutability, and low-latency access under constrained memory and system-level performance limits.

UrbanX – Refugee Social Network • github.com/shaneso/urbanx

February 2021 – May 2021

- Developed a native Android application in Java and XML to support resilient social infrastructure for Canadian refugee communities, optimizing Gradle build pipelines for accelerated compile-time performance and implementing a custom UI/UX stack via Figma-to-XML conversion workflows; awarded Best Designed App for navigational and visual design

TECHNICAL SKILLS

Languages: C++, C, Python, Java, JavaScript, TypeScript, SQL, Bash, Fortran, Matlab, Scheme, Lua, Verilog

Frameworks/Libraries: PyTorch, NumPy, SciPy, OpenCV, YOLO, JUnit, Pytest, React, Node.js, Next.js, Tailwind, Arduino, Eigen3

Developer Tools: Linux, Git, Docker, AWS, Jenkins, Firebase, CMake, Gradle, Maven, ROS, Expo, Vercel, GNU Toolchain, Vim, tmux

Embedded Systems: Renesas RA4M1, ESP32-S3, ESP8266, ATmega328P, Arm Cortex-A53, BCM2710A1, ADS1X15, 28BYJ-48