Shane So

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EDUCATION

Simon Fraser University • BSc. Data Science — Expected Graduation June 2028

- Horatio Alger Canadian Scholar
- Schulich Leader Scholarship Nominee

EXPERIENCE

Simon Fraser University AIRob 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.
- Optimized embedded software through modularity, template metaprogramming, and serial buffer fine-tuning.
- 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.
- Implemented a finite-state machine–driven acquisition pipeline coordinating sensor sampling, signal processing, and actuation scheduling with predictable latency characteristics.
- Executed high-resolution debugging, calibration, QC, and fault-isolation procedures under noisy experimental conditions, ensuring robustness and stability in a research-lab environment.
- Collaborated within a multidisciplinary engineering team in an access-controlled R&D environment, delivering production-quality code under strict reliability requirements.

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 – Pattern Recognition Trainer • github.com/shaneso/juggle_buddy — January 2025

- Designed and implemented a CV algorithm for live performance analysis with YOLO and OpenCV with HSV calibration; built at nwHacks 2026.
- Developed a modular feedback system with Pytest and joint keypoint detection for body scaling, achieving high-fidelity data acquisition for reference path training and deviation scoring.

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: STL, Eigen3, Qt, NumPy, SciPy, OpenCV, YOLO, JUnit, Arduino, React, Node.js, Next.js, Tailwind
Developer Tools: Linux, Git, Docker, ROS, RViz, CMake, GNU Toolchain, Gradle, Maven, Firebase, Expo, Vercel, PuTTY, Vim, tmux
Embedded Systems: Renesas RA4M1, ESP32-S3, ESP8266, ATmega328P, Arm Cortex-A53, BCM2710A1, ADS1X15, 28BYJ-48
Research Instrumentation: AAS, TOC Analyzer, XRF, XRD, GC, ICP-OES, Raman Microscopy, PVD, SEM