Simon (Shenghua) Jin

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Bachelor of Science in Robotics, School of Computer Science — Aug. 2026 – May 2029
Transferred from **Simon Fraser University** (Computing Science) | SFU CGPA: 4.04/4.33
Coursework: Data Structures & Algorithms, Linear Algebra, Robotic Autonomy

EXPERIENCE

Software Developer | *Ascension Robotics (Student Design Team)* — Sept. 2025 – June 2026

- Held real-time C++ object detection and tracking on a Jetson Orin Nano within a per-frame latency budget shared with the navigation stack.
- Cut manual labeling effort ~75% with annotation tooling (ONNX pre-annotation, dedup frame extraction), enabling a ~14K-image, 8-class dataset.
- Made the robot stack start at boot and stop cleanly by replacing a fragile script with a `systemd` user service, fixing cgroup, environment, and signal faults.

Undergraduate Researcher | *LiDAR–Camera Sensor Fusion,* ***Simon Fraser University*** — Jan. 2026 – Apr. 2026

- Owned integration of 2 sensors (ZED stereo camera, Robosense LiDAR) on a 5-person team's Jetson Orin Nano / ROS 2 Humble rig.
- Calibrated LiDAR–camera extrinsics to under ~3 cm translation and generally under 15 px reprojection error by seeding the 6-DoF optimizer with CAD measurements and ROI constraints.
- Designed and 3D-printed a two-tier mount holding both sensors, handling their positioning and thermal management.

PROJECTS

CUDACaml | github.com/sinj3d/CUDACaml | *OCaml, CUDA, NVRTC, Dune* — 2026

- Designed a compiler from an OCaml array DSL to CUDA (typed DAG IR, fusion, lowering, C++ emission, NVRTC JIT), fusing 5 chained element-wise ops into 1 kernel.
- Verified GPU output against a pure-OCaml reference interpreter via differential testing, with 230+ unit and 38 system tests passing on two GPU platforms.
- Exposed it via a 6-command CLI (emit, run, check, dot, list, info) and a multi-GPU runtime with async streams.

Resume Builder | github.com/sinj3d/resume-builder | *Rust, Tauri, SQLite, TypeScript* — Mar. 2026 – Present

- Shipped a local-first desktop app that stores resume content in SQLite and compiles role-tailored LaTeX resumes to PDF entirely on-device.
- Enabled offline generation with no API key by adding semantic search (ONNX embeddings in `sqlite-vec`) and an embedded llama.cpp runtime.
- Automated 5 installer formats (Windows, macOS, Linux) in CI, backed by Rust unit and golden-file tests.

Custom Hall-Effect Macropad | *C++, PlatformIO, KiCad, Web Serial* — Feb. 2025

- Built a working 6-key Hall-effect macropad end to end: 2-layer KiCad PCB, ATmega32U4, 3D-printed switches.
- Made actuation depth tunable per key via C++ firmware with per-key calibration, hysteresis, and drift compensation.
- Enabled live remapping of 9 inputs without re-flashing via a serial protocol, EEPROM config, and Web Serial UI.

LEADERSHIP

Team Captain | *Team Parabellum (FTC Robotics)* — Sept. 2022 – July 2025

- Led the team to the Innovate Award (2nd Place), FTC European Premier Event, while programming Java autonomy with a custom PIDF controller.
- Set the software roadmap and established Git/GitHub workflow standards for the software group.
- Delegated tasks and reviewed work across the software group.

SKILLS

Languages: Python, C++, Rust, OCaml, TypeScript/JavaScript, Java, SQL
Tooling: Git, GitHub Actions (CI/CD), Tauri, Docker, Linux, systemd, SQLite, CMake, Dune
ML & GPU: CUDA/NVRTC, ONNX Runtime, llama.cpp, YOLOv12, OpenCV, NumPy