

HANSON SUN

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EDUCATION

University of British Columbia

Vancouver, BC

3rd year, Bachelor of Science in Honours Computer Science, Minor in Data Science

2022 – 2027

- 95% Average, Science Scholar, Dean's List, Trek Excellence Scholarship, J Fred Muir Memorial Scholarship

EXPERIENCE

Software Engineer Intern

May. 2025 – Present

Qualcomm

Toronto, ON

- Developing a **compiler (C++)** for ML models targeting Qualcomm's Snapdragon **Low-Power eNPU** platform.
- Integrated new **compiler optimization stages** and **graph transformations**, improving inference latency by **3%**.
- Added support for **new operator types** and fused patterns, increasing compatibility by **20%** of production models.
- Resolved urgent issues in **customer ONNX models**, reducing turnaround time for deployment within **3 days**.

Embedded Software Engineer Intern

Jan. 2024 – Aug. 2024

NZ Technologies

Vancouver, BC

- Led redesign of touchless medical device: front-end (**QT/QML**), firmware (**C**), API middleware (**C++**).
- Designed a **configurable** and **stateful** data-representation/serialization system for **code-free** customization.
- Created a **cross-compiled C++** build system with **Docker** and **CMake**, resulting in **10x** faster build times.
- Implemented **Kalman filters** and **3D gesture algorithms**, increasing accuracy by **50%** and speed to **400FPS**.
- Developed a **multi-device, event-driven IP** communication scheme using **UDP**, **congestion control**, **connection management**, with a **TCP-based FTP**; achieved **98%** FTP accuracy and **40%** performance gain.

Data Engineer Research Assistant

Nov. 2023 – Jun. 2024

Pacific Laboratory for Artificial Intelligence (PLAI)

Vancouver, BC

- Spearheaded a data-processing pipeline for **200TB** of Minecraft data with **image** and **audio processing**.
- Designed Dataloaders/Datasets in **PyTorch**, integrating **variational autoencoders** to improve model training.

Undergraduate Teaching Assistant

Aug. 2023 – Dec. 2023, Sep. 2024 - May. 2025

University of British Columbia

Vancouver, BC

- Instructed tutorials, labs, and office hours for CPSC 121 (Discrete Math and Circuits), CPSC 213 (Computer Systems), and CPSC 221 (Data Structures and Algorithms). Totalling over 500+ students with 4.9/5 rating.

PROJECTS

Polyphony | C++, LLVM, CMake, GPROF, Valgrind

- A MIDI-based **programming language** with custom **stack-based** grammar, built with **C++**.
- Implemented **LLVM** IR code generation for efficient **compilation** to native register-based instructions.
- Built a performant recursive descent **interpreter**, **1.5x** faster than Racket, with error handling and **REPL** support.

Poshchure (Stormhacks 2024 winner) | React, C++, Python, Flask, scikit-learn, cv2, MediaPipe, Kintone DB

- **Fullstack** posture monitoring product with **computer vision**, **ML**, **data analytics**, and **wearable hardware**.
- Built an MVP using **React** and **Flask**, integrating an **ESP8266** wearable with **C++** and **UDP** networking.
- Analyzed video-stream features with **cv2** & **MediaPipe**, training a **sklearn** model with **90%** accuracy at **30FPS**.

MindVault | Python, SQL, HuggingFace, LangChain, SQLite, Numpy, Docker

- **Dockerized** knowledge database and **RAG agent** as a study aid for notes, served with a **REST API**.
- Implemented a custom **vector search database** using **FAISS** & **SQLite** with **bi-encoder** support and **trigram BM25 search**; achieving **10x** faster indexing and a **50%** smaller storage footprint than **sqlite-vss**.

C++ Feed-forward Neural Network | C++, Valgrind, GDB, GPROF

- Constructed a **multi-layer neural network** and a **matrix math library**, from scratch, using **C++**.

TECHNICAL SKILLS

Languages: C, C++, Python, JavaScript, Java, HTML/CSS, R, C#, Bash, \LaTeX , Rust, Julia

Frameworks/Libraries: QT/QML, AWS, PyTorch, Jupyter, Django, Node.js, Scikit-learn, NumPy, TensorFlow

Tools: Git, Docker, Linux, Valgrind, MPLAB, GDB, GPROF, WSL, CMake, Unity, Hugging Face, Arduino