Gurmukh Kharod

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Education

Simon Fraser University — *Burnaby, BC, Canada*
B.Sc., Computer Science - Software Systems — *May 2022 - May 2027*

Douglas College — *New Westminster, BC, Canada*
A.S., Computer Science and Information Systems — *Sep. 2018 - Sep. 2021*

Experience

Student Software Engineer — *Jan. 2026 - Present*
BlackBerry QNX - Acoustics Engineering Services — *Burnaby, BC, Canada*

- Developed **embedded acoustics tooling** in **C/C++** across **6 multi-language audio API modules**, supporting vehicle audio systems with up to **12 speakers**, **6 listening presets**, and **3 frequency bands**.
- Implemented **audio post-processing features** using **FFT-based analysis**, **gain matrices**, and channel configuration across **3 filtering stages** to validate playback behavior on embedded speaker paths.
- Set up and validated an end-to-end **audio measurement pipeline** using **PuTTY**, **Ethernet**, **A2B**, **RME and Scarlett** interfaces, **6 microphones**, amplifiers, and **12 speakers** to capture sine-sweep responses and observe acoustic details to support repeatable media-tuning automation.

Lead Programmer — *May 2017 - Jan. 2020*
FIRST Robotics - FRC Team — *Vancouver, BC, Canada*

- Served as **Lead Programmer** for a **60-member team**, building **autonomous C++ routines** and tuning **encoder feedback** with firmware-hardware integration to meet **FRC specifications** and improve autonomous reliability.
- Coordinated a **cross-functional 6-week sprint** with mechanical and electrical teams, using **checklists**, **test harnesses**, and **demo simulations** to de-risk integration and accelerate development under deadlines.
- Collaborated at **regional** and **world championship** events in Victoria and Houston, executing **rapid triage**, mentoring junior developers, and supporting outreach that earned the **FIRST Chairman's Award**.

Projects

Decaf Compiler - C++, Flex, Bison/Yacc, LLVM IR, Linux, Git — *May 2025 - Dec. 2025*

- Built a **C++** compiler for a C-like language, implementing lexical and syntactic analysis, **symbol tables**, semantic checks, and **LLVM IR**, achieving **100%** coverage on ∼1,200 tests with strict invariants and clear diagnostics.

SolarSense - Python, PyTorch, scikit-learn, FastAPI, React, NumPy, Git — *May 2025 - Aug. 2025*

- Constructed an AI Geo-spacial forecaster that ingests and manages NASA satellite data using **NumPy** and **SciPy**, and trains **PyTorch LSTM** and **scikit** models, serving predictions via **FastAPI** to a **React** frontend.
- Delivered a real-time solar flare dashboard, reaching **96%** accuracy with **concurrent inference**.

Gesture Tower - C, C++, OpenCV, Bazel, Node.js, Embedded Linux, Git — *Sep. 2024 - Aug. 2025*

- Co-developed a real-time multiplayer embedded-vision system on **BeagleY-AI** (Linux), implementing capture and inference pipelines in **C/C++** with **OpenCV** for **live embedded gesture recognition**.
- Bridged diagnostics to a React frontend via **TCP**, **UDP**, **HTTP**, and **WebSockets** through a **Node.js** server, using data structures and **observer/visitor** patterns to deliver a synchronized service.

Leadership

Hackathons and Mentorship - SFU CSSS and UBC CSSS — *Sep. 2023 - Oct. 2025*

- **System Hacks 2024 (Winner):** Built *Chaos Keys* in React with a live REST API; won Best Startup.
- **NW Hacks 2025 (Best UI Finalist):** Co-built *GROC*, implemented Python APIs and SQL, iterated from Figma feedback; Best UI finalist.
- **Fall Hacks 2025 (Mentor):** Mentored teams on Git, REST, and deployment, leading to several awards.
- **StormHacks 2025:** Shipped *UniVerse*, a mobile-first social app built with React Native, GeoJSON, and Socket.IO.

Technical Skills

Languages: C, C++, C#, Java, Python, JavaScript, TypeScript, Haskell, Rust, SQL, NoSQL, HTML5, CSS3
Frameworks and Build: React.js, React Native, Node.js, Express.js, Next.js, FastAPI, Spring Boot, GoogleTest
Data, ML, and CV: PyTorch, TensorFlow, scikit-learn, NumPy, Pandas, Matplotlib, OpenCV, MediaPipe, LSTM
Embedded and Systems: I^2C, SPI, GPIO, ADC, PWM, UART, MCU R5, LLVM IR, Flex, Bison, Yacc
Tooling and Platforms: Git, GitHub, GitLab, CI/CD, APIs, JSON, VMs, Netlify, Vercel, Linux, Windows, macOS