




# GURMUKH KHAROD

gsk13@sfu.ca | 778-798-8293 |  portfolio |  LinkedIn: gurmukh-k |  GitHub: GurmukhSKharod | Surrey, BC

## EDUCATION

### Simon Fraser University

B.Sc., Computer Science - Software Systems

Burnaby, BC

May 2022 - May 2027

### Douglas College

A.S., Computer Science and Information Systems

New Westminster, BC

Sep. 2018 - Sep. 2021

## EXPERIENCE

### Lead Software Engineer and Mentor

May 2017 - Jan. 2020

FIRST Robotics

Vancouver, BC

- 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 with various engineering divisions at regional and world events in Victoria and Houston, executing **rapid triage** with **real-time** validation to adapt to hardware changes and keep the robot competition-ready.
- **Mentored** junior developers in workshops and competitions, led sponsored community demos, and **taught robotics** for real-world issues such as **energy conservation** to earn the **FIRST Chairman's Award** of outstanding outreach.

### Quality Assurance Distribution Technician

Oct. 2021 - May 2022

Best Buy Distribution Center

Langley, BC

- Verified **250 units per day** in **Excel** with an **8-member** team, performing functional QA to ensure **compliance**.

## PROJECTS

### SolarSense - Python, PyTorch, scikit-learn, FastAPI, React, NumPy, Git

May 2025 - Aug. 2025

- Constructed an AI forecasting service that ingests NOAA and NASA satellite data, engineers features in **NumPy** and **SciPy**, and trains **PyTorch LSTM** and **scikit-learn** models, serving predictions via **FastAPI** to a **React** frontend.
- Delivered a real-time dashboard with live charts and details, reaching **96%** accuracy with **concurrent inference**.

### Decaf Compiler - C++, Flex, Bison/Yacc, LLVM IR, Linux, Git

May 2025 - Aug. 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.

### 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** running Linux, implementing capture and inference pipelines in **C** and **C++** with **OpenCV**, to achieve **live embedded gesture recognition**.
- Bridged device diagnostics to a React front end via **TCP**, **UDP**, **HTTP**, and **WebSockets** through a **Node.js** server, applying data structures and **observer** and **visitor** OOP patterns to deliver a synchronized dynamic service.

### Package Management System - Java, Spring Boot, JUnit, Swing, REST

May 2022 - Dec. 2022

- Constructed a **Spring Boot** API that exposes **JSON REST** endpoints and a **Java Swing** desktop client that consumes them, creating clean, testable interfaces between services and the UI.
- Implemented **CRUD** with OOP patterns and added **JUnit** tests to reduce complexity and speed up iterations.

## 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, and won Best Startup.
- **NW Hacks 2025 (Best UI Finalist)**: Co-built *GROC*, an AI price app, implemented Python APIs and SQL, iterated from Figma feedback, and became a Best UI finalist recognized for polish.
- **Fall Hacks 2025 (Mentor)**: Mentored teams on Git, REST, and deployment, leading to several awards won.
- **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<sup>2</sup>C, 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