

GURSIMRAN WALIA

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EDUCATION

University of British Columbia

Bachelor of Applied Science – Computer Engineering

- Relevant Coursework: Digital-System Design, Data Structures & Algorithms, AI/ML, Databases

Expected May 2027

Vancouver, BC

EXPERIENCE

ScaleEasy

Software Engineering Intern

May 2025 – Aug 2025

remote, Canada

- Developed backend services for an **Electronic Traffic Ticket Submissions** platform using **ASP.NET Core (C#)**, exposing RESTful APIs for ticket intake, document uploads, and case status workflows.
- Deployed and configured services on **Azure App Services with Azure SQL**, optimizing indexed queries and transactional consistency to improve submission processing performance by ~25–30% under concurrent load.
- Implemented JWT authentication, RBAC authorization policies, and structured logging integrated with Azure monitoring tools to enhance security, observability, and deployment reliability.

PROJECTS

F1TENTH Autonomous Driving Race Car

Jan 2026

- Developed the on-vehicle autonomy stack using **ROS 2 (rclpy)** on **NVIDIA Jetson**, controlling the vehicle via **VESC over UART** with real-time telemetry, logging, and diagnostics.
- Fused and time-aligned **LiDAR, IMU, and RGB-D (Intel RealSense)** data for **wall-following (PID), gap-following**, and **Automatic Emergency Braking**, achieving reliable stops at $TTC \leq 0.4$ s.
- Optimized **ROS 2 QoS, scheduling, and control gains** to reduce **camera-to-motor latency** by ~30%, validated through timestamp analysis and repeated on-track testing.

Real-Time Web Discussion Application

Jan 2026

- Built a full-stack discussion forum using **HTML, CSS, and JavaScript**, implementing a **Single-Page Application (SPA)** with custom client-side routing and dynamic DOM updates, reducing full page reloads by ~100% and improving perceived UI responsiveness.
- Developed the backend with **Node.js and Express**, designing **RESTful APIs** for chat room and user management, enabling **real-time messaging via WebSockets**, and persisting chat data in **MongoDB** to support **dozens of concurrent users** without message loss.
- Implemented an **AI-based content moderation system** that **automatically detects and blocks inappropriate language before broadcast**, filtering an estimated 90–95% of offensive messages in testing, while enforcing **session-based authentication and input sanitization** to enhance platform security.

ARC4 Decryption and Cracking Circuit

Dec 2025

- Implemented a hardware **ARC4 decryption engine in SystemVerilog**, including key scheduling and keystream generation, synthesized and deployed on an **FPGA (DE1-SoC)**.
- Parallelized key cracking using **multiple hardware cores**, reducing total crack time by ~99% (from ~3 minutes single-core to ~2 seconds).
- Verified correctness and performance using **SystemVerilog testbenches, ModelSim waveform analysis, coverage metrics**, and on-board FPGA validation.

Hotel Management System

Nov 2025

- Designed and implemented a **relational database** using **SQL (MySQL/Oracle)** to manage hotel maintenance workflows, supporting **10+ normalized tables** with enforced foreign-key constraints.
- Built a **backend web application using Node.js and Express**, structured with **controller-service layers** and REST-style endpoints, handling **hundreds of CRUD operations per test run** with consistent validation.
- Developed a lightweight **frontend using HTML, CSS, and JavaScript**, eliminating **manual record tracking (~100%)** during simulated workflows and improving visibility of maintenance requests across departments.

TECHNICAL SKILLS

Languages: Python, JavaScript/TypeScript, C/C++, C#, SQL, Bash, React, Next.js, MongoDB, Node.js, Angular, HTML/CSS

System Design: SystemVerilog/Verilog, FPGA(DE1-SOC), Quartus Prime, ModelSim, Ros2

AI/ML: LangChain, LangGraph, CrewAI, TensorFlow, PyTorch, scikit-learn, pandas, NumPy, RAG, Prompt Engineering

Automation: n8n, Zapier, Make, Relevance AI, RESTful APIs, Webhooks, Microservices, GraphQL

Cloud/DevOps: Azure, Docker, CI/CD

Databases: MySQL, MongoDB, Oracle, ChromaDB, Snowflake, Databricks

Web/Voice: React, Node.js, Express, FastAPI, Streamlit, WebSockets

Tools: Git/GitHub, VS Code, Jupyter, Docker Compose, Postman, Notion, Agile/Scrum, Cursor, IntelliJ Idea