Atharv Bhalerao

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Skills

- C, C++, Embedded C
- Python, MicroPython
- PyTorch, ML DL
- Java
- LTSPICE
- Fusion 360
- FDM 3D Printing
- Electronics Design

Projects

- **CNN Framework in C** – Designed and implemented a full CNN framework entirely from scratch in C with no external libraries. Achieved 91%accuracy on Fashion-MNIST using 3 convolutional kernels. Optimized memory footprint and sped up processing with SIMD vectorization using AVX and currently implementing multithreading to enhance speed and scalability.
- **Neural Network in C** – Built a custom neural network implementation handling dataset parsing, feedforward computation, backpropagation, and gradient descent manually. Trained on MNIST to reach 95% accuracy, demonstrating deep understanding of neural network mechanics and low-level programming.
- **C++ Terminal Graphics** – Developed interactive ASCII-based 3D rendering applications (donut.cpp and cube.cpp) displaying rotating objects in real time within the terminal. Currently building a webcam-to-ASCII art converter to strengthen C++ skills and explore live video-to-text rendering.
- **Gesture-Controlled RC (MSP430)** – Engineered a gesture-based remote-controlled vehicle using MSP430 MCU, nRF24L01 wireless module, and MPU6050 IMU. Programmed embedded firmware in C for motion interpretation and designed Python-based signal filtering pipeline for smooth control.
- **Digital Lab Multi-Thermometer** – Arduino project producing real-time multi-sensor temperature graphs in Python.
- **EMRsys** – Python CRUD-based clinic management application.
- **Flash** – Java flashcard study tool (CPSC 210 capstone).

Experience

- **Director, XOR Technology Inc.**, Vancouver *Mar 2025 – Present*
  - Leading Binarized NN SDK development for low-power microcontrollers in a team.
  - Working on power supply maintenance BNN comparable to PID control in performance.
- **Teaching Assistant, PHYS 131/158, UBC** *Oct 2024 – Apr 2024*
  - Supported first-year physics labs and tutorials on Electricity, Magnetism, and Wave Dynamics.
- **Electronics Team Member, PARSEC, UBC** *Nov 2024 – Jun 2025*
  - Developed the electronics and worked on embedded software for LunaPure lunar water filtration system, Details restricted by NDA.
- **Research Intern, IIT Bombay, India** *Jul 2024 – Aug 2024*
  - Modeled GaN MQW LED devices using drift diffusion models, LTSPICE, and Python ML analysis under Prof. Apurba Laha.
- **Technician, Learning Facilitator, STEAMOJI Kerrisdale** *Jan 2024 – Apr 2024*
  - Maintained 3D printers and computers.
  - Coached VEX IQ robotics teams on STEM and robotics basics.
- **Robot Troubleshooter, CARIS Lab, UBC** *Mar 2023 – Jun 2023*
  - Diagnosed and repaired PR2 humanoid robot with limited external support.

Education

University of British Columbia *Expected Sep 2026*

- Bachelor of Science in Physics
- Relevant Coursework: Data Structures, Algorithms, Software Engineering, Machine Learning (CPSC 330)
- Honours Math courses; Computational Physics integrating programming and numerical methods.