Anant Khanna

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Education

University of British Columbia Vancouver, BC
Bachelor of Applied Science in ***Computer Engineering*** *- Dean's List 2025* *Sept. 2024 – May 2028*

Experience

Machine Learning Software Engineer Team Lead | *UBC Uncrewed Aircraft Systems*Sept. 2024 – Present

- Integrated **YOLOv11 (PyTorch)** pipeline in Python and C++, enabling real-time **autonomous object detection** on embedded systems travelling at 50+ km/h, **optimizing inference** for low-latency execution
- Engineered a **metric learning pipeline** for target re-identification, computing mean vectors from Vision Transformer **(ViT)** embeddings to enable cosine similarity matching invariant to lighting and orientation
- Implemented **TensorRT FP16 quantization** to compress model weights, reducing memory bandwidth usage by **50%** while maintaining inference precision within **0.5%** of the baseline
- Achieved **98%** detection accuracy with model optimization, improving **mAP by 30%**

Co-founder & Lead Developer | *UBC Finds* Oct. 2025 – Present

- Built a **full-stack architecture** with live status updates using **React/Next.js** and **Supabase**
- Architected an event-driven state management system to synchronize **asynchronous user reports** and real-time map updates, ensuring atomic data consistency by eliminating race conditions
- Optimized data fetch and processing to ensure minimal latency for map rendering and report aggregation

Programming Instructor | *Code Ninjas* May 2025 – Aug. 2025

- Designed and delivered **15+** project-based C#/JS curricula and led logic-building activities for **120+** students

Engineering Intern (High School Co-op) | *Zoom Engineering Ltd.* Apr. 2024 – May 2024

- Streamlined design processes by partnering with clients to define clear technical requirements
- Authored **3** comprehensive **technical documents**, supporting successful project execution

Projects

Wealth Council | *Python, FastAPI, React, Google Gemini, Fetch.ai* Mar. 2026

- Engineered a multi-agent investment platform, winning an award at the ProduHacks x Fetch.ai hackathon
- Architected a distributed pipeline using **Fetch.ai uAgents** to asynchronously compute portfolio risk metrics and execute FinBERT-based sentiment analysis on live financial news streams
- Integrated Google Gemini to synthesize quantitative modeling and alternative asset correlations, streaming final reports to a React frontend in real-time via **Server-Sent Events (SSE)**

GuardCam: AI Dashcam | *Python, React Native, WebSockets, OpenCV* Mar. 2026

- Developed an edge-to-cloud driver monitoring system to detect micro-sleeps, utilizing a custom **TCP WebSocket bridge** to bypass HTTP overhead for low-latency video streaming
- Deployed a headless AI server on Modal GPUs to decode base64 frame data in real-time from the edge device
- Implemented **MediaPipe** and **OpenCV** to map a 468-point 3D face-mesh, calculating Eye Aspect Ratio (EAR) to trigger sub-second haptic JSON alerts

FPGA-Based Neural Network Inference Accelerator | *Verilog, FPGA, C++, ARM* July 2025

- Designed and implemented a **single-layer neural network** (**MAC unit**) on a **DE1-SoC FPGA** using **Verilog**
- Developed a **memory-mapped C++ driver** on the ARM HPS for low-latency data streaming, offloading compute to the FPGA and enabling efficient hardware acceleration under **embedded Linux**
- Achieved **3,000** inferences/sec with a **300%** performance speedup over ARM-only execution by optimizing **HPS–FPGA** communication

AI Noise Source Prediction and Forecast | *Raspberry Pi, TensorFlow, NumPy* Apr. 2025 – May 2025

- Developed an **IoT system** using **Raspberry Pi Zero 2 W** to track **real-time** noise levels across campus
- Implemented the YAMNet AI model from TensorFlow to classify noise sources with low-latency inference
- Visualized data with NumPy and Matplotlib, allowing students to find quieter study spots across campus

Technical Skills

Hardware/RTL: FPGA Design (Intel Quartus, QuestaSim, Platform Designer), Verilog, SystemVerilog, ARM SoCs
Languages: Python, C, C++, C#, SQL, Java, JavaScript, RISC-V & ARM Assembly
Technologies: Linux, PyTorch, TensorFlow, YOLO, Ultralytics, React, Next.js, PostgreSQL, MySQL, Unity, Git