DEEPANSH SABHARWAL

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EDUCATION

University of British Columbia **Kelowna, BC**
Bachelor of Applied Science, Computer Engineering *Expected 2029*
Certifications: OpenCV University – Introduction to OpenCV (2026)

RESEARCH

Edge AI Wildlife-Vehicle Collision Early Warning System **May 2026 – Present**
Undergraduate Researcher, UBC *Kelowna, BC*

- Developing a real-time embedded computer vision system on Raspberry Pi 4 with a Google Coral USB Accelerator, running a fine-tuned YOLOv8-nano INT8 model at 20–30 fps for multi-class detection of wildlife, pedestrians, and vehicles, with monocular distance estimation and GPS-adjusted dynamic proximity thresholds.
- Built a structured JSON event-logging pipeline that captures detection labels, confidence scores, GPS coordinates, and timestamps to SD card under continuous operation with zero tolerance for data loss, driving a three-tier GPIO warning system with OLED display.

TECHNICAL PROJECTS

FaultLatchedPWM [link] **2026**
Verilog HDL, FPGA | *Personal project*

- Designed a parameterizable PWM controller in Verilog HDL with synchronous fault detection for overcurrent and undervoltage conditions, latching the output to a safe state until manual reset; synthesized on a Xilinx Artix-7 using roughly 300 LUTs and 180 flip-flops at 100 MHz.
- Developed a structured test plan covering more than 20 edge cases in Icarus Verilog, including boundary conditions, fault injection, and reset sequencing, documenting each case with its configuration, expected behaviour, and observed output.

RISC-V Toolchain to Hardware Emulation Pipeline [link] **2025**
Bare-metal C, RISC-V Assembly, Verilog | *Personal project*

- Implemented a five-stage pipeline (IF/ID/EX/MEM/WB) with full hazard handling via forwarding and stalling, verifying correctness across more than 25 assembly and C test programs at roughly 1.0 IPC on the emulator.
- Built an end-to-end toolchain that compiles C with a custom RISC-V cross-compiler, links against bare-metal startup code, and executes on a cycle-accurate processor emulator.

ThermoGuard Safety System [link] **2026**
C, Arduino, Raspberry Pi, PCB Design | *UBC team project (4 members)*

- Built a real-time embedded system integrating sensor input, processing, and actuator control on a microcontroller platform, implementing GPIO control logic and UART, I2C, and SPI interfaces to drive outputs from sensor readings.
- Structured the firmware with modular drivers and control routines, collaborating across a four-member team with iterative hardware-software co-verification at the interface boundaries.

AI-in-Farming [link] **2024**
Python, TensorFlow, OpenCV | *Team project*

- Built a multi-class crop disease classifier trained on roughly 15,000 images across 10 plant classes, designing the full pipeline of data augmentation, model selection, training, and held-out evaluation to reach 92% test accuracy.

EXPERIENCE

Best Buy Canada **Jul 2025 – Present**
Sales Advisor *Kelowna, BC*

- Customer-facing technical advisory role; operated POS and inventory systems under high-throughput conditions.

The StoreNinja **Nov 2023 – Dec 2024**
Founder *New Delhi, India*

- Built and operated an e-commerce platform managing product catalog, order flow, and payment processing across more than 200 products, tracking inventory and sales metrics to inform restocking and pricing.

TECHNICAL SKILLS

Languages: C, Python, Verilog, RISC-V Assembly, Java, Bash
Hardware: Xilinx Artix-7 FPGA, Jetson Orin NX, Arduino, Raspberry Pi, Tang Nano 20k FPGA
Tools: Vivado, GTKWave, Icarus Verilog, GCC cross-compiler, TensorRT, Git, Linux
Concepts: Firmware development, hardware-software interface design, FPGA synthesis and verification, digital logic design, embedded and real-time systems