Adam Crespi

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Education

University of British Columbia **September 2022 – 2026**

Engineering Physics - 3rd Year *Vancouver, BC*

Engineering Physics is UBC's most competitive and academically challenging undergraduate specialization. This program pairs honors-level math and physics with electrical and computer engineering

- **Relevant Coursework**: Signals and Systems, Algorithms and Data Structures, OOP, Machine Learning
- Provincial Champion: Varsity Track and Field and Cross Country Athlete
- Achieved CGPA of 4.00, receiving Dean's Honour List

Professional Experience

IRDI System **January – April 2024**

Embedded Software Intern *Vancouver, BC*

- Performed system-level firmware verification for infrared receiver, ensuring 100% J2799 compliance for hydrogen refueling. Used JTAG Debugger to identify critical CRC issues in edge cases, enhancing product reliability.
- Developed PCB and test firmware compatible with NDEF standard for bidirectional P2P NFC communication to research viability of future product-line
- Designed and built ultra-cold temperature cycling system using robotic arm to simulate hydrogen refuelling process between -60C to 20C in just 4 minutes, quadrupling daily cycle count to support robust 24/7 operation

Project Experience

SLAM Navigation and Insect Detection Robot **November – Present 2024**

- Built an autonomous robot with SLAM capabilities for real-time environmental mapping and obstacle avoidance on the Jetson Orin Nano
- Engineered sensor fusion algorithm on embedded Linux in ROS2, integrating IMU, Lidar, and camera data for precise path planning and navigation.
- Trained and deployed a neural network for insect recognition, achieving 95% classification accuracy on a custom dataset and real-time inference speeds of 30 FPS using TensorRT

Neural Network Based Reactive Lighting System **August – September 2024**

- Developed a lighting control system with an ESP32 microcontroller, leveraging FreeRTOS for efficient task scheduling of audio data, signal processing, and LED control
- Trained and optimized neural network for verbal commands with Tensorflow Lite, reducing the quantized model size to 5MB
- Created custom PCB to integrate ESP32 S3, I2S microphone, and supporting components.

UBC Autonomous Robot Competition Prize Winner **July – August 2024**

- Worked in a team of 4 to design and build two fully autonomous robots to assemble burgers
- Integrated ESP32 with over 10 sensors and actuators including H-Bridges, rotary encoders, micro-switches, and power circuitry for reliable autonomous control
- Collaborated in writing extensive code-base in C++ and used ESP-NOW for live communication between robots

Skills

Embedded Systems

- Linux
- UART, SPI, I2C
- Kicad PCB

Languages

- C, C++
- Python
- Java

Tools and Frameworks

- Oscilloscope, VNA
- Git
- TensorFlow, OpenCV