Ella Majkic

UBC Engineering Physics

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Education

The University of British Columbia Sep 2023 - Present

Major in Engineering Physics, Minor in Honours Mathematics

Awards: Trek Excellence Scholarship; Eric P. Newell Engineering Award; Dean's Scholar **GPA: 90%**

Skill Summary

Software: C, C++, Python, Git, Linux, ROS, OpenCV, TensorFlow, MATLAB, Tailwind CSS, Java, JavaScript

Tools: Altium, KiCad, OnShape, LaTeX, CMake, Bash/Linux Shell, COMSOL, GDB, FPGA/VHDL

Experience

UBC Rocket Jan 2026 - Present

Hardware Engineer, Avionics Hardware Subteam

- Developed and tested hardware, firmware, and PCBs for single-stage 30km altitude competition rocket
- Wrote embedded firmware in C for a custom ignition PCB using an STM32 (ARM Cortex-M0+) MCU, allowing for communication with flight controller and precise logic for critical in-flight parachute deployement

TRIUMF Particle Accelerator Jan 2025 - May 2025

Research Engineer Co-op, PIONEER Experiment

- Developed and tested Purity Monitor Assembly (PUMA) calibration device for rare pion decay experiment
- Simulated electron drift in PUMA using COMSOL and C++, validating models against experimental data
- Designed and built a vacuum system for PUMA calibration tests, achieving stable 1e-6 bar
- Led first successful PUMA data collection tests, performing statistical analysis in Python and MATLAB
- Implemented RS-232-based data acquisition for vacuum gauges and detector readout in LabVIEW

UBC Open Robotics Sep 2023 - Mar 2025

Software Engineer, Navigation Subteam

- Used Python in a Linux environment to implement ROS-based navigation algorithms and SLAM (simultaneous localization and mapping) in real-world situations for service robot competing at international RoboCup@Home

Projects [Portfolio]

Simulated Detective Agent

Deep Learning, TensorFlow, ROS, Computer Vision, CNN, Linux

- Trained and integrated multiple robust machine learning models from scratch to enable a ROS robot agent to autonomously solve a detective-style task in Gazebo simulation, acheiving top score in course
- Designed and trained a convolutional neural network on a custom, augmented 1,000+ image dataset, achieving 99.1% validation accuracy on alphanumeric character recognition
- Used YOLOv8, OpenCV, and homography for dynamic clueboard and NPC detection within environment

Autonomous Pet Rescue Robot

C++, Electronics Design, Rapid Prototyping, PCB Assembly

- Developed, prototyped, and built a fully autonomous robot with a team capable of line following through a multi-terrain course while identifying and retrieving pet stuffies
- Designed and soldered electrical systems for motor control, microcontroller integration, and sensing
- Wrote C++ libraries to interface with 2D LiDAR sensors, H-bridges, servos, and inverse-kinematics claw

Motor Control Feedback Circuit

Digital Logic, Electronic Hardware, Circuit Design, Counters, Latches

- Built a fully hardware-implemented closed loop PID controller for active motor speed control
- Processed optical encoder motor speed outputs using custom timing, latching, error amplifiers, and DACs