

# Ella Majkic

UBC Engineering Physics

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## EDUCATION

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**University of British Columbia**

2023 - 2028

BASc in Engineering Physics; Minor in Honours Mathematics

**GPA: 90%**

**Awards:** *Trek Excellence Scholarship; Dean's Scholar; Dean's List*

## SKILL SUMMARY

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**Languages:** C, C++, Python, Java, HTML/CSS

**Tools/Environments:** Git, Linux (Xubuntu) Shell, ROS, CMake, MATLAB, KiCad, OnShape, ROOT

## EXPERIENCE

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**TRIUMF Particle Accelerator**

Jan 2025 - May 2025

**Research Assistant, PIONEER Experiment - Co-op**

- Developed and validated Purity Monitor Assembly (PUMA) for rare pion decay experiment
- Created physics simulations of particle behaviour in PUMA using COMSOL Multiphysics and C++
- Programmed simulations in Linux, using GDB for debugging and CMake for build automation
- Designed a vacuum system achieving ideal  $10^{-6}$  bar pressure, enabling first PUMA calibration trials
- Performed first tests of PUMA calibration device in vacuum and Argon gas
- Conducted robust data analysis of experimental results using MATLAB and Python

**UBC Open Robotics**

Sept 2023 - Mar 2025

**Software Engineer, Navigation Subteam**

- Programmed autonomous navigation of service robot for international RoboCup@Home competition
- Used ROS to write Python scripts allowing the robot to navigate new, dynamic environments
- Evaluated and integrated LiDAR sensors for SLAM, balancing precision and cost-performance

## PROJECTS

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**Autonomous Competition Robot**

May 2025 - Aug 2025

- Developed, prototyped, and built a fully autonomous robot for ENPH 253 competition
- Designed and soldered electrical systems (motor control, microcontroller integration, sensing)
- Developed 3,000+ lines of modular C++ code to interface with sensors and execute high-level logic
- Robot capabilities included line following, item pickup, and object detection/identification

**ROS Machine Learning Project**

Sept 2025 - Present

- Developing ROS Python scripts for a robot to drive in a simulated environment using OpenCV
- Training a machine learning model to read clues and solve a puzzle while driving in simulation

**PI Motor Controller**

Sept 2024 - Dec 2024

- Built a circuit capable of setting and controlling the speed of a motor using PI control in hardware
- Integrated digital logic (Schmitt Triggers, D-Latches, ripple counters) to achieve precise control