



Kyle Mackenzie

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TECHNICAL SKILLS

Languages: Python, C/C++, MATLAB, Erlang

Frameworks / Packages: OpenCV, ROS, Numpy, Pandas, Tensorflow, PyTorch, Matplotlib & Seaborn

Tools/Environments: Git, Linux Command Line

EDUCATION

University of British Columbia

Vancouver, BC

Engineering Physics - Bachelor of Applied Science

Sep. 2020 - May 2025 (Expected)

Coursework: Software Design, Microcomputers, Signals and Systems, Machine Learning, Calculus, PDEs.

RELEVANT EXPERIENCE

Controls Systems Co-op

September 2023 – Present

Corvus Energy

Richmond, BC

- Carried out unit tests for software and hardware functionality of battery management system.
- Wrote automation scripts for unit testing on hardware-in-the-loop test bench for battery management system.
- Developed a thermal model of the pre-charge system of the battery pack to control current while pre-charging.
- Developed a coulomb-counting algorithm to validate the State-of-Charge estimation algorithm.
- Designed and documented a process for collecting battery cell data for validation of SoC algorithm.
- Added wiring and sensors to extend functionality of a hardware-in-the-loop test bench.

Drive Controls Firmware Developer

Sep. 2022 – Present

UBC Formula Electric

Vancouver, BC

- Designed a custom torque vectoring algorithm based on existing research to control motor power and torque requests and optimize cornering speed and wheel slip conditions.
- Implemented torque vectoring algorithm in C code on an STM32 microcontroller.
- Led testing, validation, and data collection of the torque vectoring algorithm's performance.

Research Assistant

May 2023 – Aug. 2023

Cognitive Neuroscience of Schizophrenia Lab, BC Children's Hospital

Vancouver, BC

- Optimized an algorithm to perform Constrained Principal Component Analysis on brain fMRI data, and extract functional brain network components.

Full-Stack Developer Co-op

Jan. 2022 – Apr. 2022

ICBC

Vancouver, BC

- Wrote automation scripts for data entry using Blue Prism framework
- Developed prototype for automation of web form data entry using python-based libraries alternatively to the previously used internal tool, proving development time could be reduced by 50%.

TECHNICAL PROJECTS

Uni-wheeled Robot Drive Controls | 5-person Capstone project - MATLAB, Simulink

Sept. 2023 – Present

- Derived equations of motion for a single drive wheel robot and characterized as a linearized time-invariant system for our control algorithm.
- Developed Simulink model to facilitate Software-in-the-Loop testing of our control model.

Autonomous Wheeled Robot | 4 person project - C/C++, OnShape

May 2021 – Aug. 2021

- Designed the CAD model, circuit boards, and wrote the firmware in C for a wheeled robot to navigate a course to pick up items autonomously.
- Fabricated robot using sheet metal parts, laser-cut hardboard, and 3D-printed components.
- Assembled, soldered, and tested custom-designed printed circuit boards for power distribution and drive control.