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*
- Facilitated hardware and software testing for safety-critical battery management systems.
- Developed a thermal model of the pre-charge system of the battery pack to control the pre-charge current.
- Added wiring and sensors to extend functionality of a hardware-in-the-loop test bench for the battery management system software.

Drivetrain Firmware Developer Sep. 2022 – Present
UBC Formula Electric *Vancouver, BC*
- Surveyed existing research on vehicle dynamics and torque vectoring algorithms to design a custom drive algorithm to control power limiting, an active software differential, and torque control for traction optimization.
- Wrote embedded-C code on the STM32F1 board to implement the custom driving algorithm.
- Developed and led execution of a plan to test, gather data on, and validate the torque vectoring algortihm performance across multiple test days.

Research Assistant May 2023 – Present
Cognitive Neuroscience of Schizophrenia Lab, BC Children's Hospital *Vancouver, BC*
- Wrote a script in both Python and MATLAB 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*
- Reduced scripting development time by 50% using a novel web-scraping software library, Robot Framework.
- Prototyped a 3D, gamified version of current ICBC Knowledge Practice Test to increase customer engagement.

Technical Projects

Robot Design & Fabrication | *4 person project - C/C++, OnShape* Oct. 2021
- Designed the CAD model, circuit boards, and wrote the firmware in C for a wheeled robot to navigate a course and collect objects as part of the ENPH 253 course.
- 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.

Rap-GPT | *Python, PyTorch* Aug. 2021
- Implemented a Generative Transformer machine learning model in PyTorch based on the design outlined in Google's research paper *Attention is All You Need.*
- Finetuned model to generate lyrics that rhyme and follow a specific style.