Kyle Mackenzie

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Technical Skills

Languages: Python, C/C++, Java, JavaScript, Matlab
Frameworks / Packages: Tensorflow, PyTorch, OpenCV, Numpy, Pandas, Matplotlib & Seaborn
Tools/Environments: Git, Jupyter Notebooks, Unix 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, Applied Linear Algebra

Relevant Experience

Research Assistant May 2023 – Present
Cognitive Neuroscience of Schizophrenia Lab, BC Children's Hospital *Remote*

- Explored brain network structures from brain fMRI data using CPCA, a modified Principal Component Analysis.
- Developed, refactored, and tested MATLAB code to perform CPCA on multiple datasets.

Full-Stack Developer Co-op Jan. 2022 – Apr. 2022
ICBC *Vancouver, BC*

- Reduced scripting development time by 50% using a new, underused software library.
- Developed prototype for automation of company process to reduce labour and resources spent and expedite results to customers.
- Developed test cases for complex internal web application.
- Prototyped a 3D, gamified version of current ICBC Knowledge Practice Test to increase customer engagement.

Drivetrain Firmware Developer Sep. 2022 – Present
UBC Formula Electric Student Design Team *Vancouver, BC*

- Developed traction control algorithms to react to slipping in real-time and auto-correct to stabilize car.
- Researched and documented experimental control algorithms for high-performance electric cars.

Embedded Systems Developer Jan. 2021 – Sep. 2021
UBC Solar Student Design Team *Vancouver, BC*

- Developed multi-threaded communication firmware for micro-controllers to communicate through serial, radio, and cellular for real-time data acquisition during solar car races.

Technical Projects

Student-Made Robot | *4 person project - C/C++, OnShape* Oct. 2021

- Designed, prototyped, and developed the hardware, electrical, and software components of a treasure-hunting and line-following robot.
- Designed and soldered sensory circuits, and developed C-code to sense the robot's environment, and designed mechanical components of robot to navigate and exploit its environment.

Rap-GPT | *Python, PyTorch* Aug. 2021

- Implemented a multi-headed self-attention language model using PyTorch Tensors multiplication.
- Trained model on rap lyrics and poetry to generate a new style of rap.

Self-Driving with Deep-Q and Q-Learning | *Python, Tensorflow* Sep. 2020 – Oct. 2020

- Developed a Reinforcement Learning agent first with a Q-Learning model, then a Q-Learning with neural net model (Deep-Q Learning) to take in a raw video feed and output driving commands.
- Used matplotlib, scikitlearn, and Seaborn to create data visualizations for debugging