Ethan McKeen

North Vancouver, BC

ethan-mckeen
ethanrmckeen.github.io
ethanrmckeen@gmail.com
604-366-1291

EDUCATION

University of British Columbia **Completed: April, 2025**
Masters of Engineering *– Electrical and Computer Engineering with Distinction* Grade: 4.1 GPA

University of British Columbia **Completed: April, 2024**
Bachelors of Applied Science *– Electrical Engineering with Distinction* Grade: 3.8 GPA

WORK EXPERIENCE

NeuroPrior AI, North Vancouver, BC **Apr, 2024 – Sep, 2024**
Software and Firmware Engineer
- Worked with a small team to design a medical wearable EEG and ECG device.
- Wrote C-code **firmware for BLE functionality** including: advertising, connecting, and ADC data transmission
- Wrote Python code for a desktop application to connect to the BLE device with a **simple GUI**.
- Utilized **signal processing techniques** to audibly play input signals and display FFT waveforms of data.

Quadrant Electronics Inc, North Vancouver, BC **Apr, 2022 – Aug, 2022**
Junior Software Engineer
- Used Unity for proof of concept of a **VR test environment** to **train airplane pilots**.
- Computer commands could be used to change different aspects of a VR cockpit including the windshield and various gauges to train pilots to **identify broken instruments** and **fly with sub-optimal vision**.
- A **phone app** was also made for proof of concept of adapting this program into a **AR setting**.

Celly Technologies, North Vancouver, BC **Apr, 2020 – Aug, 2020**
Junior Software and Firmware Developer
- Worked with a small team to design an app to notify users of a sump pump status based on multiple coloured LED states.
- Wrote an **Android camera app** utilizing **image and video frame processing** to filter specific colours from an image.
- The system employed a **web server** to store user information and made the sump pump status available online.

RESEARCH

Transformer Based Actor Critic Agent
- Investigated use cases of **transformers in a reinforcement learning** setting. Tests were done using an actor critic model.
- Utilized **OpenAI Gym** to test the model's performance in different environments.

Orthogonal Learning for Causal Policy Inference in RL
- Explored the **improvement of a Q-learning model**'s decision-making through the incorporation of a **causal inference framework**.
- Utilized **OpenAI Gym**'s Blackjack environment to compare optimal decision making versus learned decision making.

Hybrid Physics-Informed Neural Networks and Diffusion Models for Option Pricing
- Researched a hybrid model for **financial option pricing** by combining **Diffusion Models** for stock path prediction and **Physics-Informed Neural Networks** for option price prediction.

Investigating the Role of Test Cases in LLM-Based Python and JavaScript Code Translation
- Investigated different **prompt engineering** approaches and **iterative post processing techniques** for two-way Python and JavaScript **code translation**. Our improvements increased the LLM translation success rate from **44% to 91%.**
- Tests included **generating synthetic test cases** to translate code with different LLM models including **Gemini-2.0** and **GPT-3.5**.

Vision Transformer Based Chessboard Image Analysis
- Explored the use of **Vision Transformers** for classifying digital chess board pieces for game state extraction.
- Involved extensive **data pre-processing** but was able to significantly **reduce training complexity** and time while maintaining a model **generalizable** to many board styles and colors. For 100% classification accuracy the training data required was reduced to **500 from 80,000.**

Languages		Tools		Software	
• Python	• Java	• Latex	• PyTorch	• Unity	• SolidWorks
• C and C++	• JavaScript	• Git	• TensorFlow	• Matlab	• Android Studio