Kiernan McGuigan

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Education

MASc, Systems Design Engineering, University of Waterloo September 2023– August 2025

- Graduate student in Waterloo's Vision Image Processing Lab researching spatio-temporal forecasting with applications to sea ice in the Canadian Arctic.

BASc, Software Engineering, University of Calgary September 2017 – April 2022

- Graduated with distinction having completed engineering courses in: Software Development, Software Architecture, Complexity Analysis & Testing, Data Structure and Algorithms, and Project Management.

Experience

***Advanced Analytics Associate,* Loftus Labs** May 2022 – Present

- Deployed a fast and efficient produce demand forecasting tool to improve the packing efficiency of the hundreds of products & varieties of produce suppliers.
- Designed a statistical model to generate hops demand forecasts to minimize wasted product.
- Designed a number of Tableau & PowerBi dashboards to provide customer insights into labor costs, produce costs, and crop work & condition.

***Machine Learning & Software Engineering Intern,* Cenovus Energy** July 2020 – August 2021

- Accelerated geologist workflows by researching, developing, and deploying a machine learning pipeline to find and classify geological layers including a user interface to generate, view, adjust, and export model predictions.
- Worked to productionize a fast and efficient well steam simulation algorithm to approximate the results of different steam injection plans.

***Software Engineering Summer Student,* ENMAX Power** May 2019 – August 2019

- Saved ~3 hours of engineering time per project by developing an automated project documentation generator and engineering plan signature validator. Over a one-year period this this accounts for ~$70,000 in savings.
- Improved customer visibility by with a Power Apps portal and dashboard for external customers to submit project requests and visually display the status and progress of their ongoing projects.

***Software Engineering Summer Student,* ENMAX Power** May 2018 – August 2018

- Saved 100+ hours of engineering time per year by automating change validation for devices on the electrical grid using python. This process was able to be run daily to increase the accuracy of change discrepancy detection.
- Improved electrical system operations with a Python program to analyze, query, & detect anomalies for the interactions of the over 300,000 protection and control devices on the electrical system.

Notable Projects

NFLNet: An NFL Player Tackle Prediction Model

- Developed a graph transformer to predict tackle completion probability for player performance evaluation. Published at CVIS 2024 along with delivering an oral presentation on this work.

MKNO: Multi-Kernel Neural Operator

- Developed a multi-kernel approach to improve the multi-scale capabilities of neural operators with applications in solving partial differential equations. Published at CVIS 2024.

Wildfire Prediction Model

- Collaborated with a team of engineering students to develop a machine learning model to forecast wildfire spread. This project received first place in the 2024 Waterloo AI Institute Wildfire Hackathon.

Green Energy Prediction Model

- Developed a machine learning model to predict daily renewable energy generation on the Spanish electrical system. This project received first place in the 2021 ASEC Hackathon.

Technical Skills

Languages

- Python, SQL, C, C++, Java, JavaScript, HTML, CSS, Git

Major Frameworks & Technologies

- Pytorch, TensorFlow, XGBoost, NodeJS, React, Express, MongoDB