KEVIN FREIRE

Data Science Fellow at SharpestMinds.

kmfayora@gmail.com 647-231-5593 Toronto, ON, Canada linkedin.com/in/kevinmfreire github.com/kevinmfreire

SKILLS

- **Computer Software**: Linux (Ubuntu), MS Office, LaTeX, Git, Bash, AWS, Google Cloud Platform, Heroku.
- **Programming**: Python, C++, Java, MATLAB, SQL, HTML, CSS, JavaScript, React.
- **Data Science Libraries/Tools**: PyTorch, Keras, Tensorflow, Cuda, Numpy, Pandas, hadoop, Apache Spark, flask, scikit-learn, BeautifulSoup4, Kibana, sqlite3, Jupyter Notebook, Seaborn.
- **ML Algorithms**: CNN, Fast R-CNN, Logistic Regression, Random Forrest Classifier, Decision Tree Classifier, Naive Bayes Classifier, K-Means Clustering, Proximal Policy Optimization (PPO), Markov Decision Process using value iteration and policy iteration, Monte Carlo GLIE, TD SARSA, Q-Learning and Value Function Approximation.
- **Computer Vision**: OpenCV, Torchvision, Matplotlib, Edge detection, FFT/IFFT, histogram equalization, spatial filtering.

EDUCATION

M.Eng. in Computer Engineering

Toronto Metropolitan University

Sept 2019 – Nov 2022

- A Vector Institute recognized program with AI concentration

B.Eng. in Electrical Engineering

Toronto Metropolitan University

Sept 2013 – June 2018

EXPERIENCE

Data Science Fellow

SharpestMinds

May 2022 – Present Toronto, Ontario, Canada

- **Text Classification**: https://github.com/kevinmfreire/meaningful_words
  1. Designed a Data pre-processing pipeline using **NLTK**, trained and implemented a **TF-IDF** model for feature engineering.
  2. Designed, trained and tested an NLP model using **Scikit-Learn** for text-classification, with a 70% accuracy.
  3. Developed a full-stack web application for classifying the users text as negative, positive or neutral and deployed it to the cloud.
  4. Link to application: https://tweet-sentiment-classification.herokuapp.com/
- **Name-Entity-Recognition (NER)**: https://github.com/kevinmfreire/wheres_waldo
  1. Developed a web scraping algorithm using **BeautifulSoup4** to extract content from a news article.
  2. Implemented an NER model using **Spacy** pre-trained model to extract Name, Organization and Location from text.
  3. Extracted NER entities from the contents extracted by the web scraping algorithm and stored results in a database.
  4. Link to application: https://nbc-ner-app.herokuapp.com/

Field Engineer II

Lumen Technologies, Inc.

June 2019 – Present Toronto, Ontario, Canada

- Managing Lumens Data Centers located in the Peel/Toronto Region.
- Responsible for the installation, provisioning, testing and maintenance of network services, IP equipment, Transport Equipment and media equipments.
- Collaborated with engineers, vendors and technicians in the development of data center infrastructure, customer product implementation and network designing.
- Operate equipment including Optical Time-Domain Reflectometer (OTDR), and Intelligent Optical Link Mapping (iOLM) for end-to-end testing of long haul Optical Fiber trails to meet industry standards for Network expansion.
- Analyze schematic designs of site plans, floor plans, elevations and electrical.

Meter Technician

Imperial Parking, Inc.

July 2017 – Oct 2018 | Toronto, Ontario, Canada

- Led the Meter Operations strategy to ensure all parking meters operate normally across the GTA to grow the revenue stream and profitability by 25%.
- Increased customer retention and satisfaction by 32% by attending customer trouble in a fast paced environment and meeting deadlines in a timely manner.
- Installed, troubleshoot and maintained parking meter hardware/software to meet company expansion goals.
- Maintained multi-space machines and pay on foot technology for optimal performance.

PROJECTS

Multi-scale Dilation with Residual Fused Attention (MD-RFA) for Low-Dose CT Denoising

Toronto Metropolitan University

May 2022 – December 2022 | https://github.com/kevinmfreire/MD-RFA

- Proposed a novel deep learning model that utilizes a multi-scale feature mapping with a series of dilated convolutional layers and parallel connections composed of channel- and spatial-attention modules for enhanced denoising.
- Preprocessed DICOM files using **Pydicom** and **Numpy**, built and trained network using **Tensorflow 2.0/Keras**, utilized **OpenCV** and **Numpy** for post processing of predicted images.
- Out-performed current *state-of-the-arts* denoising algorithms, in terms of **PSNR** and **SSIM**.
- Submitted a conference paper based on this research to the 20^{th} Annual International Conference of the *IEEE* International Symposium on Biomedical Imaging (ISBI 2023).

Low-Dose CT Image Reconstruction

Toronto Metropolitan University

Sept 2021 – May 2022 | https://github.com/kevinmfreire/REID-GAN

- Gathered low-dose and normal-dose data of 10 patients from the Cancer Imagining Archive.
- Pre-processed DICOM files with **Python** libraries using **Pydicom**, and converted data files into **Numpy** files for both training and testing.
- Inspired by the **ResNet** and **Inception-v3** models developed a Residual-Inception Encoder Decoder – Generative Adversarial Network (RIED-GAN) Network model using **PyTorch** for the purpose of removing noise in Low-Dose CT Scans.
- Developed an optimal feature extractor using **Torchvision** library and pre-trained model **VGG16** to calculate the feature loss between the predicted output and ground truth reducing the training time by 75%.
- Measuring performance based on Peak-Signal-to-Noise Ratio, Mean Square Error and Structural Similarity Index Measurement.

Self-Driving Vehicle

AWS DeepRacer

Jan 2021 – June 2021 | https://github.com/kevinmfreire/DeepRacer-Freire

- Using **Python** I extended AWS DeepRacer pre-built models by adding two additional **CNN** layers to the deep network and trained using the **Proximal Policy Optimization Algorithm** and custom loss functions.
- Utilized **AWS Sagemaker** for training on a cloud-based simulation then stored model weights onto **AWS S3** bucket to access and upload model to a simulated race car.
- Performed A/B testing with both the custom and AWS pre-built models and achieved a 13% increase in performance.

Speed Prediction

Toronto Metropolitan University

June 2020 – Aug 2020 | https://github.com/kevinmfreire/Speed_Prediction

- Obtained dashcam footage and speed per frame data from comma.ai programming challenge.
- Performed video pre-processing and data augmentation using **Python** libraries such as **OpenCV, Numpy** and **Matplotlib**.
- Using **Tensorflow/keras**, I applied Transfer Learning on **ResNet152** to fine tune the model for predicting the speed of a moving vehicle using dash-cam footage.