**SKILLS**

* **Machine/Deep Learning**: Classification, Regression, Feature selection, Data manipulation and visualization, Convolutional neural network, Recurrent neural network, Graph neural network, PointNet, PointNet++, Dynamic graph neural network, Data standardization, SQL, Data Mining.
* **Computer Vision**: LiDAR point cloud pre/post processing, Object detection using LiDAR point cloud and imagery data.
* **Tools**:Python (Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, SciPy, LightGBM, XGBoost, Scikit-Spatial, Dask, H2O, Tensorflow, Keras, PyTorch, OpenCV, Open3D), MATLAB, Linux System, Geographic information system, Statistical Analysis System (SAS), Tableau, CPLEX, Git.

**EDUCATION**

**Doctorate in Transportation, Logistics and Finance** Aug 2019-Dec 2022

North Dakota State University, Fargo, North Dakota

**Master of Science in Construction Management** Aug 2017-Jun 2019

University of Houston, Houston, Texas

**Bachelor of Science in Petroleum Engineering** Sept 2008-June 2012

University of Alberta, Edmonton, Alberta

**Research Projects**

* Leading the research project of automated rail extraction method using low-cost LiDAR sensor and machine learning methods. (Under Review by IEEE Sensors)
  + Algorithms: Isolation Forest, DBSCAN Modified K-mean Clusting, Modified Nearest Neighbor, Hyper Least Square Fit, and Gaussian Mixture Model。
  + Results: The overall performance shows average completeness of 96.97%, correctness of 99.71%, and quality of 96.67% for all extraction scenarios.
  + Contributions: Extracted rail tracks from extremely low LiDAR point cloud data (292 point/m2 where others use around 900 point/m2).
* Leading the research project of automated rail extraction method using low-cost lidar sensor and dynamic graph convolutional neural network (DGCNN). (In progress).
  + Algorithms: Dynamic Graph Neural Network (DGCNN)
  + Contributions: Developing a pipeline of automated rail extraction method using extremely low-density point cloud data (292 point/m2 where others use around 900 point/m2). The developed pipeline should be able to reduce unnecessary assumptions used in the previously developed machine learning based pipeline.
* Leading the research project of rail gage-based risk detection based on iPhone 12 LiDAR. (Under Review by IEEE Transactions on Engineering Management).
  + Algorithms: Logistic regression and Gaussian process classifier
  + Results and Contributions: Narrowed down the possible “high-risk” gage sections and significantly reduce the rail inspection workload by 48%.
* Leading the research project of predicting suspected elder fraud. (Under Review by MindSumo)
  + Algorithms: Extreme gradient boosting (XGBoost), light gradient boosting machine (Light XGBoost), and gradient boosting
  + Results and Contributions: Developed a reusable fraud detection pipeline, and the final result achieved an average f1 score of 98.5%.
* Leading the research project of prediction of Network-Level travel time considering the effects of weather and seasonality using Python, TensorFlow and Scikit-Learn.
  + Algorithms: Convolutional neural network, ridge regression, linear regression, support vector machine, decision tree regressor, lasso regression.
  + Results and Contributions: It was found CNN model with 3 convolutional layer, 128 nodes, and 2 dense layers outperform traditional machine learning methods by 26%.
* Completed missing pavement performance data imputation using graph neural networks. (Accepted for presentation by U.S. Department of Transportation)
  + Algorithms: Graph neural network (GNN)
  + Results and Contributions: The developed model outperforms traditionally used random forest model by around 5%.

**WORK EXPERIENCE**

**Jr Drilling Engineer** July 2015-Jan 2017

Range Resource Drilling Ltd Siparia Trinidad and Tobago

**Sales Representative** Mar 2014-June 2015

Kia West Vancouver, Canada