


Soroosh Sorkhani

 sorooshsorkhani.github.io

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EDUCATION

- Toronto Metropolitan University** Toronto, Canada
 - Master of Science in Information Technology Management Sep 2019 - Jun 2021
 - Thesis:** Feature-based Question Routing in Community Question Answering Platforms
 - Supervisor:** Dr. Ebrahim Bagheri, Dr. Morteza Zihayat
- Kharazmi University** Tehran, Iran
 - Bachelor of Science - Industrial Engineering Sep 2014 - Jul 2018
 - Project:** Implemented decision trees to predict university students' performance on their final exam

SUMMARY

- Passionate and dedicated researcher at York University, with a strong focus on machine learning and its advancements. My academic journey showcases my deep interest in understanding computer vision and natural language processing. I take pride in being a fast learner and a dependable team player. I am eager to tackle new challenges and expand my knowledge and skills. My excitement for machine learning drives me to explore its applications in various exciting fields such as computer vision, healthcare, and autonomous driving. Additionally, I am enthusiastic about the potential of machine learning in revolutionizing diverse domains beyond my current focus, broadening my horizons to contribute innovative solutions that address real-world problems.

RESEARCH AND WORK EXPERIENCE

- York University** Toronto, Canada
 - Research Assistant** Jun 2023 - Present
 - Developing a Smart City Signals system by leveraging object detection models such as YOLOv8 for real-time parking lot occupancy detection. The real-time detected occupancy of the lots is then aggregated and displayed on a web app accessible to all. (*Link to a demo on my website*)
 - Developed an advanced computer vision system, equipped with GPS data, to enable the detection of parked cars on urban streets by analyzing dashboard camera feeds. I am leading the deployment and evaluation of some state-of-the-art models such as YOLOv8. This approach addresses the lack of ground truth for on-street parking demand. (*Link to a demo on my website*)
 - Implemented machine learning models, such as Graph Neural Network and Gradient Boosted Trees, for predicting parking violations across an extensive network of 940 commercial vehicle parking facilities in Downtown Toronto. Our best model predicted the number of issued tickets precisely and within one unit of error respectively for 61.49% and 81.78% of given location-time instances. The study results will be presented at conferences and published as an academic paper.
- Canadian Tire Corporation** Toronto, Canada
 - Business Analyst** Sep 2021 - Sep 2022

Successfully monitored transportation operations and identified opportunities for improvement. Expertly managed databases using SQL and performed statistical analyses to create detailed daily and weekly reports and dashboards for internal teams and managers. Led the improvement and refinement of a data-driven managerial report containing over 5000 daily records on transportation equipment repairs. Streamlined operations by integrating data from multiple databases and automating the process using Python, resulting in a 50% reduction in daily processing time.
- Toronto Transit Commission (TTC)** Toronto, Canada
 - Research Assistant** Jan 2021 - Jun 2021

Analyzed and optimized the production process of a gradient boosting regression model built using Python and SQL and deployed on AWS infrastructure, developed by BAI Canada for TTC, to accurately predict real-time passenger counts at subway stations. Identified problems within the data pipeline and consulted on improving production in data sourcing and model development. Presented 4 potential solutions, including utilization of advanced time series models such as RNN and LSTM, to enhance overall model performance.
- Laboratory for Systems, Software and Semantics, Toronto Metropolitan University** Toronto, Canada
 - Research Assistant** Sep 2019 - Jun 2021

Developed an expert recommending system for Q&A platforms, such as Stack Overflow and Quora. Defined 74 features using techniques such as LDA topic modeling, word mover's distance text similarity, and graph embedding. Optimized the features through feature engineering and proposed a learning to rank approach that achieved 16.41% higher performance than the state-of-the-art model in NDCG@10 on 5 websites' datasets, containing over 15,000 users and 21,000 questions. Provided insights on the most important and effective features.

PUBLICATIONS

- Sorkhani, S., Etemadi, R., Bigdeli, A., Zihayat, M., & Bagheri, E. (2022). Feature-based Question Routing in Community Question Answering Platforms. *Information Sciences*

CONFERENCE PRESENTATIONS

- Sorkhani, S., Heydari, E. & Nourinejad, M. (2024). On-street Parking Occupancy Detection. *ITE Canada Annual Conference (Submitted)*
- Sorkhani, S. & Nourinejad, M. (2024). Predicting Illegal Parking Using Spatiotemporal Data. *ITE Canada Annual Conference (Submitted)*

TEACHING EXPERIENCE

- **Toronto Metropolitan University** Toronto, Canada
Teaching Assistant Sep 2019 - Dec 2020
Instructed in 5 courses:
 - **Business Intelligence and Analytics:** Running labs, teaching Machine learning in R programming language
 - **Introduction to Big Data Analytics:** Running labs, teaching Python, R, SQL, NoSQL
 - **Business Information Systems:** Running labs, teaching excel
 - **Foundation of Information Systems:** Running labs and teaching excel
 - **Managerial Decision Making:** Practicing mathematical questions

CERTIFICATES

- **DeepLearning.AI** Online
Deep Learning Specialization on Coursera Jun 2022 - May 2023
 - **Neural Networks and Deep Learning**
 - **Improving Deep Neural Networks: Hyperparameter Tuning, Regularization, and Optimization**
 - **Structuring Machine Learning Projects**
 - **Convolutional Neural Networks**
 - **Sequence Models**

PROJECTS

- **Transformer Network:** Built a transformer model that can be used for Name Entity Recognition and Question Answering.
- **Neural Style Transfer:** Developed a program to generate artistic images with arbitrary content and style.
- **Face Recognition:** Developed a face recognition system, inspired by FaceNet.
- **Semantic Image Segmentation:** Built a U-Net to predict a label for every single pixel in an image from CARLA self-driving car dataset.
- **Gini Feature Importance for RankLib Random Forest:** Developed a program to compute Gini importance of features in a random forest created by RankLib to identify the most effective features.
- **Breast Cancer Diagnosis:** Applied machine learning models, including Regression, Decision Tree, and Neural Network, to predict breast cancer diagnosis using digital images from the Breast Cancer Wisconsin (Diagnostic) Data Set. Utilized fine needle aspirate (FNA) images for training and prediction.

SKILLS

- **Programming Languages:** Python, R, SQL, NoSQL
- **Libraries:** PyTorch, scikit-learn, TensorFlow, Keras, OpenCV, SciPy, NLTK, fastText, Gensim, spaCy, L2R
- **Field:** Machine Learning, Deep Learning, CNN, Computer Vision, NLP, Transformers, Time Series, Neural Networks, Information Retrieval, Data Mining, Network Analysis
- **Systems:** AWS, Unix/Linux

COMMUNITY INVOLVEMENT

- Volunteering at Transition Toronto for Toronto Just Climate Resilience Project. Nov 2023 - Present
- Co-hosting an educational podcast on the history of Canada in Persian. Sep 2023 - Present
- Tutoring in multiple subjects such as biostatistics, statistics, and programming Feb 2023 - Present
- Volunteered at Data for Good's DataThon and proposed document classification solutions using BERT. Oct 2023
- Mentored international graduate students in the Tri-Mentoring Program, TMU. Sep 2020 - Dec 2020
- Assisted IBM in delivering CASCON x EVOKE 2019 Conference. Nov 2019

HONOURS AND AWARDS

- Graduate Development Award by Ted Rogers School of Management Mar 2020
- Exempted from Graduate University Entrance Exam as an exceptional-talent student Jul 2018

HOBBIES

- Rock Climbing, Hiking, Theatre, Piano, Chess