Asiye Baghbani

Machine Learning Scientist | AI Engineer

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Experienced Machine Learning Scientist and AI Engineer with expertise in developing ML/DL models and applying advanced algorithms, such as graph neural networks, to solve predictive challenges. Strong skills in data preprocessing, cloud deployment, and exploring LLMs for NLP and generative AI applications. Proven ability to lead research projects and deliver impactful solutions in academic and industrial environments. Proficient in Python and key ML/DL frameworks.

Work Experience

Machine Learning Scientist | AI Engineer
BusPas Inc. | Montreal, Canada

Feb 2021 - Present

- Developing and implementing machine learning and deep learning models for predictive analytics using graph neural networks and other DL techniques.
- Building Sequence to Sequence models using attention and transformer mechanisms.
- Implementing transfer learning techniques in GNNs using reinforcement learning methods.
- Conducting extensive data preprocessing, feature engineering, visualization and model optimization using SQL
- Deploying models on cloud platforms using Docker for solutions in various AI applications.
- Collaborating on projects using Python libraries such as PyTorch, TensorFlow, Streamlit, Pandas, NumPy, Scikit-learn, and Seaborn to design and test AI models.
- Exploring and using Federated Learning in order to implement Transfer Learning models in representation learning

Research Assistant
Concordia University | Montreal, Canada

Jan 2021 - Dec 2024

- Developed advanced machine learning models for real-world challenges, focusing on data-driven AI solutions.
- Mentored MSc and BSc Students in their research projects
- Used LLM models to make Intelligent Query Processor for flexible, efficient data exploration
- Published publications on AI-driven predictive models

Data Scientist and Researcher
Traffic Lab at IUST | Tehran

Jan 2018 - Dec 2020

- Led data science projects to analyze large datasets and develop AI-driven solutions for transportation planning.
- Applied statistical models and ML techniques to predict demand and optimize services based on data analytics.

Core Skills

Programming: Python (Pytorch, TensorFlow, Pandas, NumPy, Streamlit, Scikit-learn), SQL, R, C++,
Data Science and Cloud deployment tools: Jupyter Notebooks, Git, LaTeX, Docker, Azure,
Core Competencies and Interests: Machine Learning, Deep Learning, Research & Development, Cloud Deployment, Graph Neural Network Models, Large Language Models, Model Optzimization

Education

Concordia University   Jan 2021 - Dec 2024

    Doctor of Philosophy - PhD Information and Systems Engineering

Sharif University of Technology   Sep 2011 - Sep 2015

    Bachelor's Degree Civil Engineering

Languages

English *(fluent)*, **French** *(Basic)*, **Persian** *(Native)*

Publications

Predicting Passenger Flow Using Graph Neural Networks with Scheduled Sampling on Bus Networks
IEEE 26th International Conference on Intelligent Transportation Systems, 2023

Multi-STGAC: A Graph Attention Based Model for Short-term Bus Passenger Flow Forecasting
IEEE 26th International Conference on Intelligent Transportation Systems, 2023

Graph neural networks for intelligent transportation systems: A survey
IEEE Transactions on Intelligent Transportation Systems, 2023

Short-term passenger flow prediction using a bus network graph convolutional long short-term memory neural network model
Transportation Research Record, 2023

Multi-Step Short- Term Passenger Flow Prediction in Bus Networks Using Graph-Based Deep Learning Model
Transportation Research Board 102nd Annual Meeting, 2023

Short-Term Bus Passenger Flow Prediction Using Multi-Component Graph Attention Neural Network Model
Transportation Research Board 102nd Annual Meeting, 2023

Dynamic Nodes in Spatial-Temporal Graph Neural Networks: Considering Bus Schedules in Passenger Flow Prediction
IEEE Transactions on Intelligent Transportation Systems, Under Revision

TMS-GNN: Traffic- Aware Multi-Step Graph Neural Network for Bus Passenger Flow Prediction
Transportation Research Part C: Emerging Technologies, Under Revision

Reinforcement Learning-Driven Transfer Learning in Spatial-Temporal Graph Neural Networks
IEEE Transactions on Intelligent Transportation Systems, Under Revision