B M Tazbiul Hassan Anik

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Education

Ph.D. in Transportation Systems Engineering (CGPA: 3.94 / 4.00) Exp. July 2025
University of Central Florida Orlando, FL

- **Research**: Time-Series Forecasting, Predictive Modeling, Deep Learning, Statistical Inference, Experimentation.

B.Sc. in Civil Engineering (Major: Transportation) February 2021
Bangladesh University of Engineering and Technology Dhaka, Bangladesh

Experience

Graduate Research Assistant August 2022 – Present
University of Central Florida Orlando, FL

- Designed and implemented **predictive models** using deep learning architectures (e.g., Transformers, GANs) for time-series forecasting, leveraging multi-sensor data from On-Board Units (OBUs) and Roadside Units (RSUs).
- Built **Python-based ETL pipelines** and integrated **CI/CD workflows** using Docker and GitHub Actions for automating data ingestion, validation, and deployment in AWS.
- Processed and analyzed **2.5+ million telematics data points** from OEMs using Python and SQL, enabling actionable insights for decision-making across state transportation networks.
- Applied **Causal Forests** to optimize traffic signal timings, achieving a **7% reduction in delay** and **$750K in cost savings** across 20+ intersections.
- Conducted **quasi-experimentation** using Difference-in-Differences (DiD) to evaluate the impact of MPS, resulting in a **15% reduction in conflicts** with statistical and practical significance.
- Authored technical reports and collaborated with cross-functional teams, including state DOT and private agencies, to integrate machine learning models into production workflows.

Traffic Data Analyst July 2021 – June 2022
Accident Research Institute Dhaka, Bangladesh

- Queried and analyzed **500,000+ crash records** using **SQL**, identifying critical trends to inform traffic safety interventions.
- Applied **regression analysis** and **hypothesis testing** to evaluate safety outcomes with 95% confidence.
- Created visualizations (e.g., heatmaps, trend charts) using Matplotlib and Seaborn to communicate insights to policymakers and stakeholders.

Notable Projects and Publications

CitySignal Library | Ongoing | **Python, Git** April 2024 – Present

- Building a **Python library** to automate the extraction and transformation of large-scale sensor-based event data into key performance metrics (KPIs).
- Designing interactive dashboards with Plotly to monitor KPIs in batch and real-time, delivering actionable insights to stakeholders.

Incident Forecasting Model | Paper Link | **Python** December 2024

- Developed **predictive models** using GANs and Transformers on imbalanced time-series datasets, improving sensitivity (recall) by **24%**.
- Deployed the model within the CPED system to enable **real-time traffic safety monitoring** for the Florida Department of Transportation.

Motorcycle Riders' Helmet Use Behavior | Paper Link, Presentation | **Python** January 2023

- Analyzed motorcycle rider behavior using **Random Forest**, achieving **86% accuracy** in predicting helmet use.

Technical Skills

Programming & Tools	Python (PyTorch, TensorFlow), SQL, R, Git, Docker, Databricks
Machine Learning & AI	Transformers, Random Forest, Causal Inference, Time-Series Forecasting
Big Data & Cloud	AWS, Databricks, CI/CD Pipelines, Data Ingestion, ETL Processes
Statistical Methods	A/B Testing, Factorial Design, Regression Analysis, Hypothesis Testing
Data Visualization	Tableau, Matplotlib, Seaborn, Plotly