Tanvir Ahamed, Ph.D.

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Portfolio	https://tanvahamed.github.io/
Publication	https://scholar.google.com/citations?user=ELQ2fEcAAAAJ&hl=en
GitHub	https://github.com/tanvAhamed
Location	West New York, NJ

Career Summary

- Developed an efficient planning and scheduling heuristic for Wheels Up's jet ownership services and modernized the legacy Optimizer Engine by replacing CPLEX with GUROBI for Virtual Machine usage.
- Acquired four years of experience in an NSF-funded project worth $350K, focused on optimizing simulated urban freight delivery system through the implementation of high-performance algorithm design and AI-based learning.
- Obtained extensive expertise in managing and analyzing large datasets, utilizing visualization tools to discover patterns, and developing and optimizing data science algorithms to deploy cutting-edge decision support tools. Adept at implementing end-to-end solutions that bridge the gap between data and insights.
- Aided the Urban Transportation Center at the University of Illinois at Chicago with writing, data collection, and mapping for the rail elements of the Illinois State Rail Plan Update in 2017.

Education

University of Illinois at Chicago Jan 2018-May 2022
Ph.D., Civil-Transportation Engineering

University of Illinois at Chicago Aug 2016-Dec 2017
M.S., Civil-Transportation Engineering

Bangladesh University of Engineering & Technology Jan 2010-Sep 2015
B.S., Civil-Transportation Engineering

Professional Experience

Operations Research Engineer Aug 2021 – Mar 2023
Data Science Team, Wheels Up

- Developed efficient planning and scheduling heuristic for Wheels Up's jet ownership services.
- Demonstrated value of flex-related implementation style and parameters.
- Proposed alternative crew rest scenarios and reported operational impact, leading to changes in duty hours for July 2022.
- Modernized legacy Optimizer Engine by replacing CPLEX with GUROBI for Virtual Machine usage.
- Contributed to the development of a Crew Scheduling Optimizer to optimize crew resource allocation.
- Improved Optimizer Engine functionality by editing, debugging, and experimenting existing features.

Graduate Research Assistant Aug 2016 – Jul 2021
Department of Civil, Materials, and Environmental Engineering, University of Illinois at Chicago

- Multi-Tier Adaptive Memory Programming and Cluster- and Job-based Relocation for Distributed On-demand Crowdshipping

  Synopsis: Validated the effectiveness of a bio-inspired algorithm by conducting experiments in a dynamic simulation environment, which was developed using C++ and CPLEX solver
- Deep Reinforcement Learning for Crowdsourced Urban Delivery

  Synopsis: Led a team in developing a learning-based approach for crowdsourcee-request assignment, which we validated in a Python-based simulation environment. It proposed a unique characterization of crowdshipping system states, incorporated a heuristics-based policy for specific action guidance, and integrated an efficient strategy to accelerate the learning process.
- DSC Logistics' (a 3PL) Pricing Behavior in Spot Markets

  Synopsis: Conducted statistical tests, econometric modeling, and scenario analysis using proprietary data. To achieve that, I utilized Stata and SPSS software for econometric modeling and analyzed DSC's pricing practice, comparing it with DAT rates by lane and time. Models for Head Haul and Back Haul rate determination were developed, and pricing strategy recommendations were made to DSC.

Graduate Research Assistant Jan 2017 – Dec 2017
College of Urban Planning and Public Affairs, University of Illinois at Chicago

- Assistance of Urban Transportation Center on the Illinois Long Range Transportation Plan

Synopsis: Conducted rail traffic analysis using the Waybill Sample dataset, presenting freight flows by key commodities, directional flows, and geographic markets.

Publications

Peer-Reviewed Journals

- Ahamed, T., Zou, B., Farazi, N.P. and Tulabandhula, T., 2021. Deep reinforcement learning for crowdsourced urban delivery. Transportation Research Part B: Methodological, 152, pp.227-257.
- Farazi, N.P., Zou, B., Ahamed, T. and Barua, L., 2021. Deep reinforcement learning in transportation research: A review. Transportation research interdisciplinary perspectives, 11, p.100425.

arXiv Preprint Papers

- Ahamed, T. and Zou, B., 2021. Multi-tier adaptive memory programming and cluster-and job-based relocation for distributed on-demand crowdshipping. arXiv preprint arXiv:2105.13845.

Certifications

- Time Series Analysis in Python — DataCamp, 2023
  Synopsis: Worked with datasets to gain practical experience exploring Autocorrelation, Autoregressive Models, Moving Average Models, Cointegration Models, and Financial Forecasting.
- Extreme Gradient Boosting with XGBoost — DataCamp, 2023
  Synopsis: Gained practical experience in using XGBoost for classification and regression tasks, incorporating it into machine learning pipelines, and fine-tuning models for improved performance.
- Sentiment Analysis with Deep Learning using BERT — Coursera, 2023
  Synopsis: Fostered several valuable skills in the field of natural language processing (NLP). These include multi-class classification, neural networks, and PyTorch implementation of Google AI's BERT model. With these skills, I am now equipped to effectively analyze and classify sentiment in large sets of text data, providing valuable insights for a range of applications.
- High Level Design of Food Delivery Apps — Scaler, 2023
  Synopsis: Developed skills in designing scalable web applications for food delivery apps. The course covered various topics, including efficient data structures like Geo Hashing and Quadtree, as well as Proximity Service, Bandwidth Optimization, Geolocation, and Component Design.
- Case Study: Analyzing Customer Churn in Tableau — DataCamp, 2023
  Synopsis: Acquired skills in Tableau to analyze customer churn rates, create visualizations, calculated fields, and dynamic graphs using filters and parameters, and present your findings in a story format.

Projects

- Medical Support Centers Allocation During Natural Disaster
  Synopsis: Optimized allocation of limited medical support centers during earthquakes using Mixed Integer Linear Programming, Pyomo modeling language, and Coin-or branch and cut solver. Maximized effective reachable population while satisfying given constraints.
- Column Generation to Solve the Vehicle Routing Problem with Time Window (VRPTW)
  Synopsis: Employed the column generation approach via the Gurobi solver in Conda environment to optimize VRPTW, demonstrating its efficacy.
- Netflix Movie Recommendation Engine
  Synopsis: Developed a movie recommendation system to outperform Netflix's Cinematch algorithm by predicting user movie ratings using a dataset of movie ratings and customer IDs, solving both a recommendation and regression problem.

Technical Skills

Programming	Python, C, C++, MATLAB, HTML, CSS.
Commercial solver	CPLEX, GUROBI.
Database management tool	MySQL.
Statistical software	STATA, RStudio.
Data visualization	Tableau.
Containerization	Docker.
Container orchestration	Kubernetes.
Others	Microsoft Office.