

Aheer Sravon

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SUMMARY

Machine Learning Engineer specializing in Graph Neural Networks (GNNs) for fraud detection, distributionally robust optimization, and reinforcement learning for competitive dynamics. Published IEOM 2024 conference paper on GNN-based fraud detection achieving 0.81 AUC on IEEE-CIS dataset; authored preprint on variance-based DRO framework outperforming benchmarks on CIFAR-10-C and Waterbirds; developed RL pricing simulations with Q-learning, PSO, PPO, and DQN agents replicating theoretical equilibria. Delivered 2.89M BDT annual cost savings through industrial optimization at AKIJ Textile Mills. Expert in PyTorch, PyTorch Geometric, Gymnasium, and scalable ML deployment.

SKILLS

- **Machine Learning:** PyTorch, TensorFlow, Scikit-learn, Graph Neural Networks
- **Programming:** Python, R, MATLAB, C/C++, Bash Scripting, Lua Scripting (Neovim), SQL
- **Specialized:** Distributionally Robust Optimization, Convolutional Neural Network, Operations Research, Statistical Analysis

LANGUAGES

- **English** – Professional Working Proficiency | IELTS Academic Band 7.0/9.0 (Listening: 7.5, Reading: 7.0, Writing: 7.5, Speaking: 6.5)
- **Bengali** – Native Speaker
- **Japanese** – Elementary Conversational Proficiency

PROJECTS

Fraud Detection using Graph Neural Networks

Jan 2024 – Jan 2025

Machine Learning & Graph Neural Networks | Published

Python, PyTorch Geometric, Scikit-learn

- Published conference paper at IEOM 2024 presenting novel GNN-based fraud detection framework formulated as node classification on transaction graphs (DOI: 10.46254/BA07.20240105)
- Implemented GNN architecture with attention mechanisms and message passing for credit card fraud detection on IEEE-CIS dataset, achieving 0.81 AUC on highly imbalanced data (3.5% fraud rate)
- Constructed heterogeneous graph connecting transaction nodes to entity nodes (cards, addresses, devices, email domains) exploiting topological features to detect fraud rings, demonstrating superior accuracy, precision, and recall compared to traditional methods

Adaptive Framework for Robust Neural Network Generalization Under Distribution Shift

Aug 2025 – Nov 2025

Deep Learning Research | Preprint: arXiv:2511.05568 | Submitted to Conference

Python, PyTorch, NumPy

- Developed variance-based Distributionally Robust Optimization framework improving neural network robustness to distribution shifts by dynamically assigning per-sample robustness budgets
- Implemented efficient water-filling algorithm with $O(B \log B)$ complexity per batch, eliminating need for group labels through unsupervised learning
- Achieved superior performance on CIFAR-10-C and Waterbirds benchmarks while maintaining competitive clean data accuracy, with manuscript currently under peer review

Pricing Competition Simulation Using RL and Optimization Agents

Jun 2025 – Nov 2025

Reinforcement Learning & Optimization | Under Review

Python, Gymnasium, NumPy, Matplotlib

- Developed duopolistic pricing game simulations across logit, Hotelling, and linear demand models to analyze AI-driven market dynamics and competitive equilibrium strategies
- Implemented Q-learning, PSO, PPO, and DQN agents modeling competitive strategies with and without AR(1) demand shocks, performing ablation studies on memory and simultaneous moves

- Conducted experiments analyzing agent interactions, equilibrium prices, profits, and markups across 5-seed runs, replicating theoretical benchmarks with manuscript currently under peer review

Supply Chain Inventory Simulation for Perishable Goods

Dec 2024 – Feb 2025

Discrete-Event Simulation

Python, SimPy, Pandas

- Developed multi-echelon supply chain simulation (1 source, 2 DCs, 4 retailers) managing 6 perishable mango varieties with EOQ/ROP replenishment and truckload optimization
- Implemented Weibull-based transit deterioration, FIFO inventory aging, and substitution logic tracking service levels and cost metrics over 40-day simulation period
- Contributed to design, debugging, and metrics implementation for undergraduate thesis on perishable goods logistics, optimizing stockout and holding costs

Industrial Attachment: Textile Manufacturing Optimization

Jun 2024 – Jul 2024

Statistical Analysis & Operations Research

Python, R, ggplot2

- Performed statistical analysis on fabric rejection data and conducted efficiency studies across 327 Picanol, Toyota, and Rapier looms, achieving 90.39% average loom performance
- Developed optimized power consumption plan reducing operational costs by 2.89 million BDT annually through downtime reduction and equipment automation
- Applied Pareto analysis to identify major fabric defects and provided actionable recommendations improving safety and productivity at AKIJ Textile Mills

Optimizing Coal Transportation in India

Oct 2023 – Dec 2023

Operations Research & Linear Programming

R, ggplot2

- Optimized coal transportation from 7 mines to 10 thermal power plants using linear programming and transportation algorithm, minimizing logistics costs via Indian Railways
- Calculated transportation costs from actual Google Maps distances applying Russell's approximation method and optimality analysis
- Determined minimum total transportation cost of 57,013.72 million rupees, validated through both R programming and manual calculations for India's energy infrastructure

Customer Churn Analysis and Retention Strategy Optimization

Aug 2024 – Sep 2024

Data Analytics & Machine Learning

R, RStudio, ggplot2

- Analyzed customer churn dataset using univariate, bivariate, and correlation analyses to identify contract type, monthly charges, and tenure as top churn predictors
- Conducted survival analysis and feature importance studies revealing higher churn rates in month-to-month contracts and fiber optic internet customers
- Segmented customers into risk cohorts providing actionable retention strategies to reduce churn and improve customer lifetime value through data-driven decision-making

EXPERIENCE

Industrial Engineering Intern

June 2024 – July 2024

AKIJ Textile Mills Ltd.

Golora, Manikganj, Bangladesh

- Performed statistical analysis on fabric rejection data across 327 Picanol, Toyota, and Rapier looms, conducting efficiency studies that identified major defects using Pareto analysis and achieved 90.39% average loom performance
- Developed optimized power consumption plan reducing operational costs by 2.89 million BDT annually through downtime reduction, loom optimization, and equipment automation strategies
- Evaluated complete fabric production process including winding, warping, sizing, drawing, and weaving operations, providing actionable recommendations for enhanced safety, productivity, and ergonomics

EDUCATION

Bangladesh University of Engineering and Technology

Dhaka, Bangladesh

B.Sc. in Industrial and Production Engineering, CGPA: 3.15/4.00

2020 – 2025

- **Undergraduate Thesis:** Fraud Detection: A Graph Theoretical Approach Using Graph Neural Networks (Published at IEOM 2024, DOI: 10.46254/BA07.20240105)

- **Relevant Coursework:** Computer Programming Techniques (4.0/4.0), Computer Programming Techniques Sessional (4.0/4.0), Probability & Statistics (3.75/4.0), Operations Research (3.0/4.0)

- **Academic Achievements:** Completed 161.75 credits; Strong performance in technical courses including Electrical Machines (3.75/4.0), Engineering Economy (4.0/4.0), Thermodynamics (4.0/4.0)

STANDARDIZED TEST SCORES

Graduate Record Examination

Quantitative Comparison 163/170, Verbal 154/170

November, 2025

IELTS Academic

Band 7.0/9.0 (Listening: 7.5, Reading: 7.0, Writing: 7.5, Speaking: 6.5)

October, 2025

CERTIFICATIONS

- **Mathematics for Machine Learning** – Imperial College London (Coursera)
- **Combinatorics and Probability** – University of California San Diego (Coursera)
- **Python Data Structures** – University of Michigan (Coursera)
- **Using Python to Access Web Data** – University of Michigan (Coursera)
- **Programming Fundamentals** – Duke University (Coursera)
- **Writing, Running, and Fixing Code in C** – Duke University (Coursera)
- **Introduction to Data Analytics for Business** – University of Colorado Boulder (Coursera)
- **Excel Skills for Business: Essentials** – Macquarie University (Coursera)
- **Excel Skills for Business: Intermediate I** – Macquarie University (Coursera)

REFERENCES

Dr. Ferdous Sarwar

Professor

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Bangladesh University of Engineering and Technology

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- **Relationship:** Thesis Supervisor

Dr. Kais Bin Zaman

Professor

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- **Email:** kaiszaman@ipe.buet.ac.bd
- **Office Extension:** 7013
- **Relationship:** Undergraduate Academic Advisor
- **Expertise:** Artificial Intelligence, Machine Learning, Operations Research, Uncertainty Quantification