Rifat Ahmed

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Education

B.Sc. in Mechatronics and Industrial Engineering *Feb 2019 – Jun 2024*
Chittagong University of Engineering & Technology (CUET) CGPA: 3.26/4.00
Junior/Senior CGPA: 3.57/4.00

Undergraduate Thesis: *Optimum Location Selection for Mobile Manufacturing Facilities in Bangladesh: A Fuzzy AHP and BWM Approach* *Supervisor: Dr. Jamal Uddin Ahamed, CUET*

- Used Fuzzy AHP and BWM to evaluate candidate locations for mobile manufacturing facilities in Bangladesh.
- Identified the most suitable site based on multiple decision criteria and practical industrial considerations.

Research Experience & Publications

[1] R. Ahmed, J. I. Haider, M. Hasan, A. K. Debnath, W. Ahmed, and S. Uddin, "Portable Network-Connected Monitoring Device for EV Induction Motors Using ESP32 and Raspberry Pi with Multi-Sensor Data," 2025. doi: 10.1109/EICT68394.2025.11355550.

[2] R. Ahmed, "Robustness-Aware Comparative Analysis of Deep Learning Architectures for Bearing Fault Detection Across Input Representations and Operating Conditions," *Under review, PEEIACON 2026 (IEEE Conference)*, 2026.

[3] R. Ahmed, "Fault-Tolerant Reinforcement Learning for Real-Time IoT-Driven Scheduling in Smart Manufacturing: A POMDP-Based Belief State Approach," *Under review, PEEIACON 2026 (IEEE Conference)*, 2026.

Research Interests

Smart Manufacturing; Machine Learning and AI; Fault Detection and Diagnostics; Industrial IoT; Computer Vision and Robotics; Operations Research and Decision Analytics.

Notable Projects

- **Image Processing Based Object Sorting Robot:** Developed an automated pick-and-sort robotic system using Raspberry Pi and OpenCV for real-time shape detection. The system integrates camera-based object recognition, servo-driven gripping, and DC-motor-based turning for sorting different objects based on their geometric features. *GitHub*
- **Data-Driven Retail Inventory Management:** Built an end-to-end inventory analytics pipeline for demand forecasting and stockout-risk prediction, combined with EOQ/ROP-based replenishment recommendations. The project also includes a dashboard interface for monitoring inventory status and supporting data-driven decision-making. *GitHub*
- **Skin Disease Classification Web App:** Developed a CNN-based skin lesion classification web application using the HAM10000 dataset, integrating deep learning for accurate multi-class prediction. The system was deployed with a Flask API backend and a React frontend to enable real-time inference, seamless user interaction, and an intuitive, user-friendly diagnostic interface for practical use. *GitHub*

Standardized Test Scores

IELTS Academic Overall: 6.5 *(No band < 6)*
R: 7.5 | L: 7.0 | S: 6.0 | W: 6.0
GRE General Q: 161 | V: 141

Technical Skills

- **Programming:** Python, C, MATLAB, SQL
- **ML/AI:** TensorFlow/Keras, scikit-learn, CNN, LSTM, CNN+LSTM
- **Data & Signal Processing:** NumPy, Pandas, FFT, STFT, feature engineering, time-series analysis
- **Optimization & OR:** EOQ/ROP, linear programming, integer programming, AHP, Fuzzy AHP, BWM
- **IoT & Computer Vision:** ESP32, Raspberry Pi, multi-sensor acquisition, OpenCV
- **Web, Database & Tools:** Flask, Streamlit, React, MySQL, Git, Jupyter Notebook, LaTeX, Linux, Windows

Leadership Experience

Publication Secretary, IEOM CUET Student Chapter May 2023 – Jun 2024

- Assisted in arranging the Inter-University Scientific Poster Presentation Competition.
- Awarded "IEOM Outstanding Student Chapter Award – GOLD" during tenure.

Joint Office Secretary, CUET Sports Club May 2023 – Jun 2024

- Coordinated administrative operations and event logistics for one of the largest student clubs on campus.
- Helped organize inter-university and intra-university sports tournaments (online/offline).

Assistant Publication Secretary, Green for Peace May 2023 – Jun 2024

- Supported publication and outreach activities for environmental awareness campaigns and events.

Mentoring Experience

- Organized and conducted a five-day Arduino and electronics workshop for incoming freshmen (2022).
- Trainer for Line-Follower and Obstacle Avoider Robot Workshop at Cantonment Public Collegiate School (2021).

Achievements & Credentials

- **Technical Scholarship:** Awarded in 2019 and 2021 (Top 15 students in department).
- **2nd Runners Up:** Inter-University Robo Soccer, IUT (2019).
- **Champion:** Intra-University Table Tennis, CUET (2024).

References

Dr. Jamal Uddin Ahamed
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Dept. of Mechanical Engg., CUET
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Dr. Sajal Chandra Banik
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