

Mahbir Ahmed Maheen

Third Year Undergraduate Student, Department of Materials and Metallurgical Engineering (MME)
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PERSONAL STATEMENT

I hold very strong research interests in machine learning–driven materials discovery, density functional theory, and characterization of materials. Experienced in applying ML models to predict material properties and integrating computational insights with experimental understanding. I am aiming to make impactful contributions to science and society through advanced materials engineering.

ACADEMICS

- **B.Sc. in Materials and Metallurgical Engineering**, BUET (Ongoing) November 19, 2022-Till Date
CGPA: **3.02** on a scale of **4.00** Expected Graduation Date: **January 2028**
- **Higher Secondary School (HSC), Science**, Comilla Board June 2019–December 2021
GPA: **5.00** on a scale of **5.00**
- **Secondary School Certificate (SSC), Science**, Comilla Board January 2016–February 2019
GPA: **5.00** on a scale of **5.00**

SKILLS AND COMPETENCES

Laboratory: Mechanical Properties of Materials, Corrosion Study, Fracture Mechanics, Characterization of Materials.

Technical Skills: Matlab, Python, C and C++, SolidWorks, Machine Learning, Density Functional Theory, LaTeX, MS Office.

PROJECT

- **Property Prediction for Single Alloys**-Performed various ML algorithms such as the SVR ($R^2=0.896161$, MAE=0.012222), Neural Network ($R^2=0.946172$, MAE=0.006336), Linear Regression ($R^2=0.720202$, MAE=0.032934), and Ridge Regression Model ($R^2=0.720164$, MAE=0.032938) and evaluated the best model for prediction.
- **Predicting Density of Materials Using Linear Regression Model**-Performed data preprocessing, ML model evaluation(R^2 , RMSE), and compositional density correlation analysis for materials design insights.
- **Reimagining Steel Slag Use: Sustainable Ceramic Tiles**-Collaborated with five team members to develop cost-effective tiles from steel industry waste materials, optimizing composition to improve modulus of rupture (MOR) through SEM, compositional analysis, and performance evaluation.
- **Battery Materials: A Compositional Discovery**-Extracted data from the Materials Project using API and performed preprocessing and feature engineering with NN evaluation ($R^2=0.904606$, MAE=0.050935).
- **Leveraging Unsupervised Machine Learning for Feasibility Studies in Industrial Production of Iron and Steel Products in Bangladesh: An Analysis Using Bangladesh Statistical Bureau and Customs Data**—Used the K-means clustering algorithm and GMM with an engineered dataset and found the top 10 products in accordance with feasibility.

PRESENTATIONS

- **Catastrophic Accidents Caused by Material Failure:** Presented the importance of materials engineering with real industry examples.
- **Creep Failure: The Silent Killer in Superheat Tube:** Presented high-temperature failure beyond theoretical understanding.
- **Steel Fatigue: The Invisible Enemy of Liberty:** Presented the Liberty failure criteria from a materials perspective, binding theory with practical knowledge.

TEACHING EXPERIENCES

Shikho,

Dhaka, Bangladesh

Mentor and Content Developer (Physics)

November 2024-Till Date

- Mentored students in physics with an emphasis on conceptual understanding, quantitative problem solving, and exam-oriented reasoning.
- Developed curriculum-aligned digital physics content, strengthening my skills in pedagogy, assessment development, and academic communication.

10 Minute School,

Dhaka, Bangladesh

Project Executive (Academics)

January 2024-June 2024

- Created concise, high-impact science learning materials and mentored students through concept-driven explanations for large-scale digital platforms.
- Gained experience in simplifying complex scientific ideas, assessment design, and effective teaching communication.

PROFESSIONAL EXPERIENCE

Industrial Trainee at Abul Khayer Steel

July 2025

- Gained practical experience in steel production, supply chain management, and mechanical systems like electric arc furnaces, rebar rolling mills, material handling equipment, automated drives, and sensors. production monitoring system along with a discussion about the possibility of integrating machine learning with real-time monitoring systems

EXTRACURRICULAR ACTIVITIES AND AFFILIATIONS

- Represented MME faculty inter-faculty cricket and football tournaments, developing teamwork, leadership, and time-management skills while balancing academic responsibilities. February 2023 - Till Date
- Actively participated in and organized programs for BUET Robotic Society, BUET Media and Communication Club, and BUET Blood Donation Club, contributing to event coordination, teamwork, and community engagement. December 2022 - Till Date
- Volunteered with the BUET Admission Test Team under BUET Scout Society, coordinating students and guardians, and fostering communication across diverse cultural and social backgrounds. March 2023

HONORS AND AWARDS

- Secured 2nd Place in the National Mathematics and ICT Olympiad, recognizing excellence in analytical and problem-solving skills.
- Secured 9th position in the Junior School Certificate Examination and 3rd position in the Secondary School Certificate Examination based on academic merit.