Md. Maruf Mullah

Email: md.marufmullah50@gmail.com LinkedIn: marufmullah50 GitHub: marufmullah50 Portfolio: marufmullah50.github.io

ACADEMIC CREDENTIALS

B.Sc. in Mechanical Engineering, Military Institute of Science and Technology (MIST) Apr 2021 – May 2025
CGPA: 3.23 / 4.00

RESEARCH INTERESTS

- Advanced and Smart Manufacturing Systems
- Computational Mechanics and Numerical Modelling
- Data-Driven and Machine Learning Applications in Engineering
- Advanced Engineering Materials and Material Characterization

BACHELOR'S THESIS

Densification of Natural Wood to Improve Structural Properties
Advisor: Major Md. Anisur Rahman, EME, Assistant Professor, ME Dept., MIST

- Studied structural performance of natural, seasoned, and chemically treated–densified wood.
- Investigated three tropical species: *Swietenia macrophylla*, *Albizia procera*, and *Cordia subcordata*.
- Chemical treatment involved NaOH and Na_2SO_3 followed by thermo-mechanical hot-press densification.
- Conducted mechanical, moisture absorption, and SEM analyses following ASTM standards; densified samples showed highest strength.

PROJECTS

Traditional Machine Learning
Surface Roughness Prediction *2025*

- Built regression models (LR, RF, GB, SVM, DT) to predict surface roughness.
- Best model: Decision Tree ($R^2 = 0.85$); analyzed influence of cutting parameters.
- GitHub

Time-Series Forecasting
Wind Speed & Direction Prediction *2024*

- Applied ANN, RNN, LSTM, and CatBoost on meteorological time-series data.
- Performed feature engineering, temporal modeling, and comparative evaluation.
- GitHub

Deep Learning & Computer Vision
Casting Defect Classification *2026*

- Compared CNN, MobileNetV3, ViT, and YOLO classifiers on industrial datasets.
- Achieved 99.9% accuracy using YOLO-based classifier.
- GitHub

YOLO Vision Applications *2026*

- Implemented segmentation (brain MRI), detection (PPE compliance), classification, and real-time tracking.
- Managed dataset preparation and annotation using Roboflow.
- Optimized training pipelines and inference for real-world deployment.
- GitHub

LLM Applications
RAG Research Assistant *2026*

- Developed a local Retrieval-Augmented Generation (RAG) chatbot for research assistance.
- Integrated document ingestion, web scraping, and structured Markdown knowledge storage.
- Enabled local inference and Gemini 2.5 Flash Lite integration for reliable responses.
- Applied in surface roughness research for fast literature insight extraction.
- GitHub

PUBLICATIONS

Conference Papers and Book Chapters

- A. Tahsin, **Md. Maruf Mullah**, et al. *Impact Strength and Moisture Behaviour of Natural, Densified and Seasoned Wood.* ICMEAS 2025 (Accepted).
- Z. Imtiaz et al., **Md. Maruf Mullah**. *Meteorological Drought Prediction Using Forecasting Models.* ICWFM 2025 (Book Chapter – Accepted).

MANUSCRIPTS IN PREPARATION

- I. Alam et al., **Md. Maruf Mullah**. *Effect of Groove Shapes on Microstructural and Mechanical Behavior of Pipe Welds under Post-Weld Heat Treatment.* Manuscript under revision for journal resubmission.

TECHNICAL SKILLS

Programming: Python, C, C++, MATLAB, HTML
Machine Learning: Scikit-learn, NumPy, Pandas
Deep Learning & Computer Vision: PyTorch, TensorFlow, YOLO (Detection, Segmentation, Classification, Tracking), Roboflow
LLM & Generative AI: RAG, LLM Inference (Local & API-based), Hugging Face Transformers
Data Visualization: Matplotlib, Seaborn, Excel, Google Sheets
Simulation: ANSYS, COMSOL Multiphysics
CAD / 3D Printing: SolidWorks, FreeCAD, Anycubic Cobra
Documentation: LaTeX, Microsoft Word, Google Docs

PROFESSIONAL EXPERIENCE

Management Trainee Officer (Engineer) — Assessment Program
PRAN-RFL Group, Kaliganj Agro-Processing Ltd. Jul 2025
Kaliganj, Gazipur, Bangladesh (On-site)

- Participated in structured assessment for manufacturing operations and engineering roles.
- Observed production workflow, plant layout, and assisted in machine monitoring.
- Prepared technical and operational reports demonstrating analytical and communication skills.

Mechanical Engineering Intern
IFAD Autos PLC Feb 2024 – Mar 2024
Dhamrai Upazila, Dhaka, Bangladesh (On-site)

- Assisted in vehicle assembly, mechanical fitting, and torque verification.
- Observed quality control procedures and assembly line balancing.
- Gained hands-on exposure to automotive manufacturing systems.

CO-CURRICULAR ACTIVITIES & AWARDS

Government Scholarships
Recipient of Government Scholarship in the **Primary Education Completion (PEC)** Examination *2012*
Recipient of Government Scholarship in the **Junior School Certificate (JSC)** Examination *2015*

Science Fair Champion — Upazila Level, Raipura *2017*
Led a school team to first place by presenting an applied science project.

Bangladesh Boy Scouts — Scout Volunteer *2015–2016*
Served as a scout volunteer at high school, supporting discipline management, event organization, and community service activities.

Volunteer, ICMEAS 2022
Assisted in conference logistics, participant coordination, and technical session management.

Volunteer, Job Fair 2022
Supported employer coordination, registration, and event operations.

Organizing Committee Member, Soccer Bot Competition — MIST *2024*
Contributed to planning, team coordination, and competition execution under MIST Robotics initiatives.

Humanitarian Volunteer *2024*
Engaged in flood relief operations and winter clothing distribution programs.

CERTIFICATIONS

- Machine Learning Specialization (Supervised Learning) — Coursera *2024*
- Neural Networks and Deep Learning (Neural Networks and Deep Learning) — Coursera *2025*
- Mathematics for Data Science — Simplilearn *2025*
- Python Programming Bootcamp — Decoders Academy *2025*
- MATLAB Onramp — MathWorks *2025*
- Git Training — Simplilearn *2025*
- Google Sheets — Simplilearn *2025*
- Project-Based Excel — Grameenphone Academy *2025*

REFERENCES

Major Md. Anisur Rahman, EME
Assistant Professor, ME Dept., MIST
Email: anisur@me.mist.ac.bd

Dr. Md. Sayem Hossain Bhuiyan
Associate Professor, ME Dept., MIST
Email: sayem@me.mist.ac.bd