Curriculum Vitae

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Tanvir Hossain

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Education

BSc in Mechanical Engineering Jan 2020 – June 2024
Islamic University of Technology - Gazipur, Bangladesh

- GPA: **3.9**/4.0; Class Rank: **3**/36

Work Experience

Lecturer in Mechanical Engineering (adjunct) June 2025 – Ongoing
Military Institute of Science and Technology - Mirpur, Bangladesh

Publications

International Conference

- Ahmed, H., **Hossain, T.**, Ahmed, A., Alam, C.S., Abuhatira, A. Hossain, Z. Investigation of Clamp Numbers and Positions to Mitigate Flow-Induced Vibration in High-Speed Superheated Steam Flow Through a Pipe Elbow. *International Mechanical Engineering and Congress Exhibition 2025* **(Abstract Accepted)**

International Journal

- Khan, T.E., Sakib, S.H., Sakib, N. **Hossain, T.**, Ehsan, M., Khan, Y.. Multi-objective Optimization of a Cascaded Supercritical CO2 Brayton Cycle Cascaded with Ejector Enhanced Transcritical CO2 Refrigeration Cycle and Flash Tank Absorption Refrigeration Cycles.*Energy Conversion and Management: X*. doi.org/10.1016/j.ecmx.2025.100988

Research Experience **(click the link to read the full PDF)**

1. *Optimization of Clamp Numbers and Positions to Mitigate Flow-Induced Vibration in High-Speed Fluid Flow Through a Pipe Elbow* Jan 2024 – May 2024
Undergraduate Thesis — Supervisor: Dr. Md. Zahid Hossain

- Investigated high-speed (50-65m/s), high-pressure (12.58MPa) superheated steam dynamics on bent pipe using RSM turbulence model and one-way FSI coupling.
- Analyzed total acceleration and deformation for 13 different clamp positions using transient structural.
- Resulted in a **33%** reduction in acceleration and a **35%** reduction in displacement using just two clamps.

2. *Experimental Study on Non-linear Vibration of Sandwich Composite Specimen* Pre-defense Doc Aug 2023 – Dec 2023
Research Project — Supervisor: Dr. Md. Zahid Hossain

- Fabricated two sandwich composite specimens comprising a Butyl Rubber core between stainless steel plates, and tested for non-linearity using shaker.
- Designed a 3DOF spring mass damper system in MATLAB-Simulink and compared the result with the experimental results.
- Wrote a Python code for FFT algorithm to analyze the vibration in frequency domain.

3. *Supercritical CO2 Recompression Brayton Power Cycle cascaded with Transcritical CO2 Ejector Refrigeration Cycle and Flash Tank Enhanced VAR system* Research Project — Supervisor: Dr. Mohammad Monjurul Ehsan Jan 2024 – May 2024

- Analyzed the exergy destruction across the components using CoolProp library in Python.
- Illustrated the Ph diagram, integrated power and cooling cycle, and exergy analysis using Adobe Illustrator.
- The Final cascaded model resulted in a **4.4%** reduction in overall exergy destruction compared to the standalone system.

Projects **(click the link to read the full PDF)**

4 DOF Robotic Arm for Picking and Sorting Objects Report Jan 2023 – Jan 2024
Undergraduate Capstone Project
Supervised by Dr. Md. Rezwanul Karim

- Built a GUI interface in Python using the Tkinter library to test the actuators.
- Wrote the arm manipulation code in Python using Numpy based on Forward Kinematics.

Chassis of Project Altair Mars Rover - Musafir June 2023 – Jan 2024
European Rover Challenge 2023, Kielce, Poland

- Designed the **6kg** compact rover, Musafir, using Stainless Steel.
- Tested load-carrying capacity and structural dynamics using ANSYS to maintain it under 75kg.

Electric Box of Project Altair Mars Rover June 2023 – Jan 2024
European Rover Challenge 2023, Kielce, Poland
- Designed a vertical electric box SOLIDWORKS using **12mm** thick plywood for ease of access.
- Created a custom conduit system for wire access through and across the chassis length.

Autonomous Flight of Unmanned Aerial Vehicle for Disaster Response June 2020 – June 2021
IMechE UAS Challenge 2020 & 2021
- Ran demo autonomous flight run of tricopter using Mission Planner.
- Collaborated in the manufacture of a new VTOL.

Research Interests

- Deep Reinforcement Learning
- Terramechanics
- Non-linear Vibration
- Model Predictive Control
- Space Robot Design
- Fluid-Structure Interaction

Skills

- **Design and Simulation**: SOLIDWORKS, ANSYS Fluent
- **Programming**: ROS, Python, Arduino, Julia, PyTorch
- **Control and Automation**: MATLAB, LABVIEW, Ardupilot Mission Planner
- **AI**: ML, RL

Leadership Activities

- **Chief Editor** - *IUT Robotics Society* Oct 2023 – July 2024
  Led the magazine team for the publication of a brand new robotics magazine - *Genesis*
- **Chassis Design Architect** - *Project Altair* June 2023 – May 2024
  Led the chassis subteam of Project Altair for the European Rover Challenge, 2023, onsite
- **Chief of Robotics** - *IMechE IUT Student Chapter* Aug 2023 – May 2024
  Organized robotics competitions and took workshops

Achievements

- International Rover Challenge 2024 - Best Science Team, India (Team Achievement) 2024
- International Rover Challenge 2024 - 6th Position, India (Team Achievement) 2024
- European Rover Challenge 2023 - 17th Position, Poland (Team Achievement) 2023
- International Rover Design Challenge 2022 - 13th Position, Virtual (Team Achievement) 2022
- European Rover Challenge 2021 - 10th Position, Virtual (Team Achievement) 2021
- IMechE UAS Challenge 2021, Design Challenge Award (Team Achievement) 2021
- OIC Partial Scholarship, Bangladesh 2020

Certifications

- Supervised Machine Learning: Regression and Classification . June 2024
  Stanford Online, Coursera
- ERC Space and Robotics Industry Standard Practice Program . Sept 2023
  European Space Foundation
- Industrial Training Course . June 2023
  BPDB, Rajshahi, Bangladesh

Reference

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