Curriculum Vitae
Tanvir Hossain

Last updated in July 2025

📍 Dhaka, Bangladesh   ✉ tanvirhossain2@iut-dhaka.edu   📞 +8801764108869   🔗 Tanvir Hossain   in Tanvir Hossain

Education

BSc in Mechanical Engineering   Jan 2020 – June 2024
Islamic University of Technology (IUT) - Gazipur, Bangladesh
- <u>GPA</u>: **3.9**/4.0; <u>Class Rank</u>: **3**/36
- <u>Relevant Coursework</u>: Computer Programming and Applications, Electronics and Digitization Techniques, Measurement, Instrumentation and Control, Machine Design I & II, Capstone Design I & II, Mechanical Vibration, Control System and Industrial Automation

Work Experience

Lecturer in Mechanical Engineering (adjunct)   June 2025 – Ongoing
Military Institute of Science and Technology (MIST)- Mirpur, Bangladesh
- <u>Responsibilities</u>: To conduct lab experiments for 1st and 2nd year undergraduate students
- <u>Courses Assigned</u>: Machine Shop and Practice, Workshop Practice Sessional, Computer Programming Language Sessional

IELTS Instructor   January 2025 – May 2025
MENTORS' - Banani, Bangladesh
- <u>Responsibilities</u>: To teach and take practice tests of the four sections of IELTS test over 30 classes per batch.

Research Interests

- Reinforcement Learning
- Robot Locomotion
- Robotic Manipulation
- Diffusion Modelling

Publications

Conference Proceedings
- 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* (**Final Draft Submitted**)

Peer Reviewed 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 & Projects (click the link to read the full PDF)

1. *RL integrated diffusion model for Generative AI*   July 2025 – Ongoing
Voluntary Research Project
Mentor: Md. Md Sakib Hossain Shovon (MS @KAIST AI)
- Testing different Reinforcement Learning algorithms like PPO, weighted MLE to assign a reward at each step of the diffusion model denoising process.

2. *Hierarchical RL for quadruped locomotion control with Dual Curriculum Design based environment generation*   June 2025 – Ongoing
Voluntary Research Project
Mentor: Md. Amir Hossain Raj (3rd year PhD at - Goerge Mason University, CS Department)
- Testing Implementing Dual-Curriculum Design algorithms to train a quadruped robot having Teacher-Student based RL controller on a gradually challenging environment and swiftly switch gaits according to different terrains.

3. 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 and wrote Forward Kinematics code for motion planning and object manipulation.
- The final arm had a reach of **25.4cm** fully extended and a load capacity of **100g**.

4. Chassis & electric box of Project Altair's Mars Rover - Musafir   June 2023 – Jan 2024
European Rover Challenge 2023, Kielce, Poland
- Designed the **6kg** compact rover, Musafir, using Stainless Steel and tested load-carrying capacity and structural dynamics using ANSYS.
- Designed the placement for electric box and the science module.

5. 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 and led the autonomous navigation of waypoints using Mission Planner.
- Collaborated in the manufacture of a new VTOL.

6. *Investigation of Clamp Numbers and Positions to Mitigate Flow-Induced* Jan 2024 – May 2024
Vibration in High-Speed Fluid Flow Through a Pipe Elbow
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.

7. *Supercritical CO2 Recompression Brayton Power Cycle cascaded with* Jan 2024 – May 2024
Transcritical CO2 Ejector Refrigeration Cycle and Flash Tank Enhanced
VAR system
Research Project — Supervisor: Dr. Mohammad Monjurul Ehsan
- Analyzed the exergy destruction across the components using CoolProp library in Python.
- The Final cascaded model resulted in a **4.4%** reduction in overall exergy destruction compared to the standalone system.

Skills (B-Beginner, I-Intermediate, E-Expert)

- **Design and Simulation**: SOLIDWORKS (I), ANSYS Fluent (I)
- **Programming**: ROS (I), Python (E), Arduino (E), Julia (B), PyTorch (B), Gymnasium (I)
- **Control and Automation**: MATLAB (I), LABVIEW (I), Ardupilot Mission Planner (I), Mujoco (I)
- **AI**: Reinforcement Learning (I), Diffusion Model (B)

Language Proficiency

- English – **IELTS - 8.5** (Listening: 9, Reading: 9, Writing: 7, Speaking: 8) 29 Sept 2024

Leadership Activities

- **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

- European Rover Challenge 2023 - 17th Position, Poland (Team Achievement) 2023
- 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
  - For securing a ranked position in the IUT admission examination

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

Dr. Md. Zahid Hossain
Professor
Mechanical and Production Engineering Dept.
Islamic University of Technology
Email: zahidmce@iut-dhaka.edu [↗]

Dr. Mohammad Monjurul Ehsan
Professor
Mechanical and Production Engineering Dept.
Islamic University of Technology
Email: mpe.ehsan@iut-dhaka.edu [↗]