MD MIRAJ AREFIN

WebSite | Scholar | Email | GitHub

Research Interests: Robotics and Intelligent Systems, Machine Learning, Artificial Intelligence

RESEARCH EXPERIENCES

Robotic Ultrasound Imaging System Oct 2025 - Present

Graduate Research Assistant | Supervisor: Dr. Mehmet Efe Tiryaki

- Developing an automated robotic system to perform ultrasound imaging with a bi-manipulator system
- Working on a robotic laparoscopic surgery system

Fixed Wing VTOL for Emergency Medical Vaccine Supply Sep 2023 - March 2024

Undergraduate Research Assistant | Supervisor: Dr. Md. Ashraful Islam

- Designed and constructed a hybrid fixed-wing VTOL aircraft having a take-off weight of 8kg.
- Utilized SolidWorks, Blender, Adobe Illustrator for design and laser cutting, 3D printing technology to build the frame.
- Designed the vehicle with a modular structure for easy disassembly and transportation.
- Achieved successful takeoff and landing at an altitude of 40 meters and a flight time of approximately 5 min in VTOL mode.

PUBLICATIONS AND CONFERENCES

1. M.M.M Haque, S.R. Dhrubo, A.Z. Pranto, A. Ahmed, **Miraj Arefin**, M. Arifuzzaman, M.S. Islam, "Impact of Process Parameters and Material Selection on the Mechanical Performance of FDM 3D-Printed Components", *Hybrid Advances*. doi.org/10.1016/j.hybadv.2025.100502
2. **Miraj Arefin**, D. Mondal, and M. A. Islam, "Thermodynamic Analysis of Cascade Refrigeration System using Low GWP Refrigerants for Low-Temperature Application", *Energy Convers. Manag. X* 2024, 24:100722. doi.org/10.1016/j.ecmx.2024.100722
3. M.T. Rana, **Miraj Arefin**, N. Sharmin, H. A. Begum, M. F. Raihan, A. Rahman, "Dynamic Modeling and Propulsion System Analysis with LQR-Based Control System for Enhanced Performance of a Lighter-Than-Air Aerial Drone", in *DELTAS-2024*. doi.org/10.1007/978-981-96-8101-3_2
4. N. S. Mooaz, **M. M. Arefin**, S. R. Dhrubo, and A. Ahmed, "Transforming UAV Design: Coandă-Based Lift Generation for Enhanced Aerial Performance," in *7th International Conference on Electrical Information and Communication Technology (EICT 2023)*, IEEE, 2023. doi.org/10.1109/EICT61409.2023.10427637

ACADEMIC CREDENTIALS

Middle East Technical University (METU), Turkey Sep 2025 - Aug 2027 (Expected)

Masters in Science : Robotics **CGPA: __/4**

Advisor : Dr. Mehmet Efe Tiryaki

Khulna University of Engineering & Technology (KUET), Bangladesh Jan 2018 - May 2024

Bachelor of Science in Engineering : Mechanical Engineering **CGPA: 2.62/4**

STANDARDIZED TEST SCORES

- **IELTS (Dec 27, 2024):** Overall 7 (Listening: 7.5, Reading: 8, Writing: 6, Speaking: 6)
- **TOEFL (Apr 23, 2025):** Total 87 (Listening: 25, Reading: 19, Writing: 22, Speaking: 21)
- **GRE (Oct 8, 2024):** Total 302 (Quantitative: 165, Verbal: 137, AWA: 3.5)

TECHNICAL SKILLS

Robotics:	Reinforcement Learning (PPO)
Simulator:	MuJoCo, Isaac Gym, Gazebo
CAD:	SolidWorks, AutoCAD, KeyShot, Blender
Programming:	Python, C/C++, MATLAB
Frameworks/OS:	ROS2, TensorFlow, OpenCV, Ubuntu
Hardware:	Arduino, Raspberry Pi, STM32, Pixhawk/ArduPilot
Operating Skills:	3D Printer, CNC, Laser Cutter, Vinyl Cutter, Lathe Machine
Others:	MS Office (Word, PowerPoint, Excel), LaTeX, Adobe Illustrator, Adobe Photoshop

REFERENCES

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