+1 (937) 939-0596
arrafim1@udayton.edu
musabbir-arrafi.me

GitHub
LinkedIn
StackOverFlow

Musabbir Ahmed Arrafi

ACADEMIC QUALIFICATION

M.Sc. in Mechanical Engineering   **University of Dayton, Ohio, USA**
2024-2026

B.Sc. in Robotics & Mechatronics Engineering   **University of Dhaka, Bangladesh**
Last 75 credits CGPA **3.52**, Overall CGPA **3.24** out of 4.00   2018-2023

RESEARCH INTEREST

Computer vision, Deep Reinforcement Learning, Control System, Robot vision and perception

PUBLICATIONS

- Islam, M. A., **Arrafi, M. A.,** Peas, M. H., Hossain, T., Hasan, M. M., Murshed, S., & Tania, M. J. (2025). Predicting urban landslides in the hilly regions of Bangladesh leveraging a hybrid machine learning model and CMIP6 climate projections. Geosystems and Geoenvironment, 100354.
- Rahman, S., Ahmed, S. F., Shahid, O., **Arrafi, M. A.,** & Ahad, M. A. R. (2021).Automated detection approaches to autism spectrum disorder based on human activity analysis: A review. Cognitive Computation, 1-28.

RESEARCH EXPERIENCE

Autonomous Driving Research in DaRC-ARMS lab   **August, 2024 — Present**
Supervisor: Dr. Krishna B Kidambi, Dr. Nicholas Stiffler   *University of Dayton, Ohio, USA*

- Exploring the applications of deep reinforcement learning algorithms combined with physics-based machine learning for autonomous navigation for uncertain environment on the F1tenth platform

Precision Agriculture and Food safety Research Project   **July, 2022 — July, 2024**
Supervisor: Dr. Md Mehedi Hasan   *University of Dhaka, Bangladesh*

- Developed an automated plant disease detection and forecasting pipeline for native crops of Bangladesh utilizing computer vision and deep learning algorithms
- Worked on developing an autonomous shelf-life monitoring system for fruits and vegetables by estimating the weight, volume, moisture content and deterioration state by computer vision algorithms

Landslide susceptibility mapping and flood vulnerability analysis   **September, 2023 — July, 2024**
Supervisor: Dr. Md. Ashraful Islam, Dr. Md Mehedi Hasan   *University of Dhaka, Bangladesh*

- Developed an automated landslide mapping and flood vulnerability analysis pipeline for Bangladesh using data collected from satelite and UAV by deep learning and computer vision

Autonomous robot navigation (Undergrad Final year project)   **January, 2022 — December, 2022**
Supervisor: Dr. Shugata Ahmed   *University of Dhaka, Bangladesh*

- Explored applications of deep reinforcement learning algorithms for autonomous map-less robot navigation in unstructured and unknown terrain by self-supervised method
- We build a mobile robot that learns to navigate through unseen mapless environments utilizing D3QN and TD3 algorithm

Professional Experience

Machine Learning Engineer   **April 2023 – October, 2023**
Ontik Technology (collaboration with Dr. Javed Mostafa, UNC, Chapel Hill)   *Dhaka, Bangladesh*

- Developed and deployed an intelligent appointment booking system on GCP with NLP models

Engineer level 1 (IoT & AI)   **May 2021 – February, 2023**
Datasoft Manufacturing & Assembly Inc.   *Dhaka, Bangladesh*

- Contributed to firmware development and automation scripts with C/C++ and python for embedded devices and contributed to backend codebase for IoT products
- Contributed to the implementation of computer vision projects on embedded devices

Mentor (Robotics)   **March 2019 — 2022**
Bangladesh Robot Olympiad   *Bangladesh*

- Mentored gold-medal winning teams of 2020 and 2021 in International Robot Olympiad from Bangladesh
- Conducted several hands-on workshops on basic Robotics, embedded systems, ROS1, CAD, and programming in Python for k-12 children in Bangladesh

Relevant Skills

Programming	Python (Pandas, Numpy, Scipy, TensorFlow, Keras, SciKit Learn, PyQT, MySQL, Pytorch, FastAPI, Parallel programming, RestAPI), Embedded C++ ,MATLAB
Development boards	Arduino AVR boards, Arduino SAMD borads, ESP32/8266, Raspberry-Pi, Nvidia Jetson Nano
Tools & Environments	Git, ROS1-ROS2, Gazebo, OpenAI Gym, Linux, SQL, noSQL, BASH/Shell
CAD	SolidWorks
Fabrication	3D printing, Laser cutting, soldering, embedded system prototyping, Welding

Honors and Awards

ROBI datathon 2.0   **June 2022 – August 2022**
Top 10 finalist team (out of 400+ teams of Southwest Asia)   *Dhaka, Bangladesh*

- Benchmarked ensemble learning, bagging and boosting models for feature selection and provided a solution based on geospatial industry dataset(approx 40GB) and proposed our solution

CAD competition   **March 2019**
Runners Up   *IUT, Bangladesh*

- Made 3D CAD model and performed motion study and fluid simulation using SOLIDWORKS

References

Dr. Krishna Bhavithavya Kidambi	*Assistant Professor, University of Dayton, USA*
Dr. Nicholas Stiffler	*Assistant Professor, University of Dayton, USA*
Dr. Md Mehedi Hasan	*Assistant Professor, University of Dhaka, Bangladesh*
Dr. Md. Ashraful Islam	*Assistant Professor, University of Dhaka, Bangladesh*