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Musabbir Ahmed Arrafi

[Website](#)
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ACADEMIC QUALIFICATION

B.Sc. in Robotics & Mechatronics Engineering

Last 75 credits CGPA 3.52, Overall CGPA 3.24 out of 4.00

University of Dhaka, Bangladesh

2018-2023

RESEARCH INTEREST

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

PUBLICATIONS

- 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.
[DOI:10.1007/s12559-021-09895-w](https://doi.org/10.1007/s12559-021-09895-w)

RESEARCH EXPERIENCE

Precision Agriculture and Food safety Research Project

Supervisor: [Dr. Md Mehedi Hasan](#)

July, 2022 — Present

University of Dhaka, Bangladesh

- Developing an automated plant disease detection and forecasting pipeline for native crops of Bangladesh utilizing computer vision and deep learning algorithms
- Working 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

Supervisor: [Dr. Md. Ashraful Islam](#), [Dr. Md Mehedi Hasan](#)

September, 2023 — Present

University of Dhaka, Bangladesh

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

Autonomous robot navigation (Final year project)

Supervisor: [Dr. Shugata Ahmed](#)

January, 2022 — December, 2022

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

AI driven Autism Detection

Supervisor: [Dr. Sejuti Rahman](#)

March 2020 – June 2021

University of Dhaka, Bangladesh

- Benchmarked several models such as SVM, LSTM, VGG16, Inception on publicly available datasets for autism detection through gaze detection, gait Pattern and repetitive behavior monitoring

PROFESSIONAL EXPERIENCE

Machine Learning Engineer

[Ontik Technology](#) (collaboration with [Dr. Javed Mostafa](#), [UNC](#), [Chapel Hill](#))

April 2023 – October, 2023

Dhaka, Bangladesh

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

Engineer level 1 (IoT & AI)

Datasoft Manufacturing & Assembly Inc.

May 2021 – February, 2023

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

Mentor (Robotics)

Bangladesh Robot Olympiad

March 2019 – 2022

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 Languages	Python (Pandas, Numpy, Scipy, TensorFlow, Keras, SciKit Learn, PyQT, MySQL, Pytorch, FastAPI, Parallel programming, RestAPI), Embedded C++ ,MATLAB, SQL, noSQL, BASH/Shell, Git, Latex
AI	Regression, Ensemble learning, Classification, Clustering, Dimensionality Reduction, Transfer Learning, Word Embeddings, NLP, Reinforcement learning, CNN, GCNN, NeRF, DRL
Development boards	Arduino AVR boards, Arduino SAMD boards, ESP32/8266, Raspberry-Pi, Nvidia Jetson Nano
Tools & Environments	ROS, Gazebo, MQTT, Microsoft AirSim, OpenAI Gym, Linux, PlatformIO, ESP-IDF
CAD	SolidWorks
Fabrication	3D printing, Laser cutting, soldering, embedded system prototyping, Welding

HONORS AND AWARDS

ROBI datathon 2.0

Top 10 finalist team (out of 400+ teams of Southwest Asia)

June 2022 – August 2022

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

Runners Up

March 2019

IUT, Bangladesh

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

VOLUNTEERING ACTIVITIES

President

Student club, Dept of Robotics and Mechatronics Engineering

2022 – 2023

University of Dhaka, Bangladesh

Information Technology Coordinator and Supervisor

Bangladesh Robot Olympiad

2019 – 2023

Bangladesh

Vice-Chair, Program Coordinator

IEEE Robotics and Automation Society, student branch chapter

2019 – 2022

University of Dhaka, Bangladesh

REFERENCES

Dr. Md Mehedi Hasan

Assistant Professor, University of Dhaka, Bangladesh

Dr. Md. Ashraful Islam

Assistant Professor, University of Dhaka, Bangladesh

Dr. Shugata Ahmed

Assistant Professor, University of Dhaka, Bangladesh

Moshiur Rahman

COO, Ontik Technology

Hasan Rahman Ratan

Managing Director, Datasoft Manufacturing & Assembly Inc. Ltd