Musabbir Ahmed Arrafi

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Education

UNIVERSITY OF DHAKA
B.Sc.(Honors) in Robotics & Mechatronics Engineering
📅 2018-2022 📍 Dhaka, Bangladesh

Skills

PROGRAMMING
• Python (Pandas, Numpy, Scipy, TensorFlow, Keras, Pytorch, SciKit Learn, PyQT, Parallel programming, MySQL, RestAPI, FastAPI)
• C/C++ (Embedded system)

MACHINE LEARNING
• Regression, Ensemble learning, Classification, Clustering, Dimensionality Reduction, Neural Nets, Transfer Learning, Word Embeddings, Reinforcement learning

DEEP LEARNING
• CNN, Transformers, RNN, LSTM, GAN, DRL

CAD
• SolidWorks

DEVELOPMENT BOARDS
• Arduino, ESP32/8266, Raspberry-Pi, Nvidia Jetson Nano

TOOLS & ENVIRONMENTS
• Linux, ROS, Gazebo, MQTT, Microsoft AirSim, OpenAI, PlatformIO

FABRICATION
• 3D printing, Laser cutting, soldering, Welding

Competitions

ROBI DATATHON 2.0
Top 10 finalist
📅 June-August 2022 📍 Dhaka, Bangladesh
• Benchmarked ensemble learning, bagging and boosting models and provided a solution based on geospatial industry dataset(approx 40GB) and proposed our solution

CAD COMPETITON
Runners up
📅 2019 📍 IUT, Bangladesh
• Made 3D CAD model and performed motion study in SOLIDWORKS

Professional Experience

MACHINE LEARNING ENGINEER
Ontik Technology (collaboration with Dr. Javed Mostafa, University of North Carolina, Chapel Hill)
📅 April 2023– October, 2023 📍 Dhaka, Bangladesh
• Developed and deployed an intelligent appointment booking system model on GCP

ENGINEER LEVEL 1 (IOT & AI)
Datasoft Manufacturing & Assembly
📅 June 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

Worked as Engineering Intern before being promoted to Engineer Level 1

ROBOTICS MENTOR
Bangladesh Robot Olympiad
📅 March 2019 — Present 📍 Dhaka, Bangladesh
• Mentored gold medal-winning teams of 2020 and 2021 from Bangladesh in the International Robot Olympiad
• Conducted several hands-on workshops on basic Robotics, embedded systems, ROS1, CAD, and programming in Python for k-12 children in Bangladesh

Research Experience

PRECISION AGRICULTURE AND FOOD SAFETY RESEARCH PROJECT
Supervisor: Dr. Md Mehedi Hasan
📅 April 2022 – Present 📍 University of Dhaka, Bangladesh
• Developing an automated plant disease detection 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
Supervisor: Dr. Shugata Ahmed
📅 March 2022 – February 2023 📍 University of Dhaka, Bangladesh
• Exploring deep reinforcement learning algorithms for autonomous map-less robot navigation in unstructured and unknown terrain by self-supervised method

AI DRIVEN AUTISM DETECTION
Supervisor: Dr. Sejuti Rahman
📅 March 2020 – July 2021 📍 University of Dhaka, Bangladesh
• Benchmarked models such as SVM, LSTM, VGG16, Inception on publicly available datasets for autism detection through gaze detection, gait patterns and repetitive behavior monitoring

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

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 & LAZYCHAT
HASAN RAHMAN RATAN	MANAGING DIRECTOR, DATASOFT MANUFACTURING & ASSEMBLY INC. LTD

VOLUNTEERING ACTIVITIES

PRESIDENT

📅 2022 - present   📍 University of Dhaka, Bangladesh

Student club, Dept of Robotics and Mechatronics Engineering, University of Dhaka

INFORMATION TECHNOLOGY COORDINATOR, SUPERVISOR

📅 2019 - Present   📍 Bangladesh

Bangladesh Robot Olympiad

VICE-CHAIR, PROGRAM COORDINATOR

📅 2019 - 2022   📍 University of Dhaka, Bangladesh

IEEE Robotics and Automation Society, student branch chapter, University of Dhaka