FAHIM HAFIZ

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RESEARCH INTERESTS

Machine Learning, **IoT**, **Health Informatics**, **Computer Vision** and HCI.

EDUCATION

United International University, Dhaka, **Bangladesh** June 2023 — Present
Master of Science (M.Sc) in Computer Science Engineering

Bangladesh University Of Engineering and Technology, **Dhaka**, **Bangladesh** February 2016 — January 2021
Bachelor of Science (B.Sc) in Electrical and Electronic Engineering CGPA: 3.87(13th in the Department)

RESEARCH and ACADEMIC EXPERIENCE

North South University Dhaka, Bangladesh
Research Assistant 2022 — Present
United International University Dhaka, Bangladesh
Lecturer, Department of CSE February 2022 — Present

Military Institute of Science and Technology Dhaka, Bangladesh
Lecturer, Department of EECE March 2021 — February 2022

PROJECTS EXPERIENCE

Designing Microprocessor Lab and Network Lab Project Manual using Raspberry Pi (ongoing) 2024-present
We are working on building a repository that any student can follow to implement complex engineering problems utilizing Microcontrollers, and sensors as well as build IoT-based Systems. You can see the detailed implementation strategy once our paper regarding this project is published online which is under review now. In the Microprocessors and Microcontrollers Lab design part, we have created these 4 experiments: 1) Interfacing of Gas Sensor using Arduino & Showing the Sensor Data in OLED Display. 2) Wi-Fi communication and building IoT-based systems using Arduino and XAMPP/Arduino IoT Cloud. 3) Introduction to Raspberry Pi (Gen 4 Model B/B+). 4) Image/Video Processing and Object Detection using Raspberry Pi.

Image processing in SEM Images (ongoing) 2024-present
This is a recent project I am doing as an RA at North South University. I am performing basic image processing on Scanning electron microscope (SEM) images of different solid-state devices.

Unsupervised Clustering in single-cell RNA-seq data 2023
In this work, I tried to apply different clustering algorithms in scRNA-seq data for enhanced clustering accuracy for such unstructured data.

Face Recognition based door lock system using Raspberry Pi 2018-2019
We completed this project during our undergraduate studies, deploying TensorFlow to create a deep neural network for a real-time, face recognition-based security system. We controlled the opening of a door and lighting a light using Raspberry Pi. When Raspberry Pi detects a face, then it applies machine learning algorithms to decide if it is the face of a known person or not. The known persons are trained persons which visible in UI and their access in the room can be controlled with a checkbox. A person can only enter only if his face is known to the database and the relevant person's permission is granted in the control panel.

Hand Gesture Controlled Robotic Arm Using EMG Sensor 2018-2019
We utilized EMG sensors to measure small electrical signals generated by muscles to mimic the control of the actual hand using a prototype robotic hand. The EMG sensor connected to the human hand can pick up the muscle movement and send similar instructions to a robotic hand that can replicate the similar movement performed by the actual hand.

'Catch The balls'- A game for interactive logical gaming system using proteus 2018
Undergraduate Level, BUET

PUBLICATIONS

Conference paper
[**Accepted in Tiny Tracks, ICLR-24**] Sayeedi, M.F.A., Hafiz, F. and Rahman, M.A., 2024. MosquitoFusion: A Mul-

ticlass Dataset for Real-Time Detection of Mosquitoes, Swarms, and Breeding Sites Using Deep Learning. arXiv preprint arXiv:2404.01501.

Journal paper
[**Under review in Wiley's Computer Applications in Engineering Education**] Designing a Microprocessors and Microcontrollers Laboratory Course Addressing Complex Engineering Problems and Activities

Conference paper
[**Under review**] Enhancing Typing Speed and Ergonomics Through Optimal Keyboard Design: A Reinforcement Learning Approach

AWARDS and CERTIFICATES

AI in Public Health Workshop — Child Health Research Foundation, Bangladesh
Workshop on time series forecasting using Deep Learning Methods. — 2024

Organiser Appreciation Award — Dept. of CSE, UIU
Awards for organising the CSE Project Show each trimester — 2024

Dean's List Award — Undergraduate Level, Dept. of EEE, BUET
Given to students who achieve CGPA above 3.75 — 2017-2021

Winner, Inter University MATLAB Competition — EEE DAY Competition '19, BUET
2nd in MATLAB Contest in BUET — 2019

OTHER EXPERIENCES

Currently overseeing the responsibilities of UIU Robotics Club — UIU Robotics Club, UIU
Moderator — January, 2024 — Present
Organizing 'CSE Project Show' in each trimester at UIU — UIU
Main Organiser — 2023 — Present
Working in a voluntary blood donor organization'BADHAN' — BUET
Vice President, Kazi Nazrul Islam Hall BADHAN Zone — 2019 — 2020

SKILLS

- **Programming:** MATLAB, PYTHON (Numpy, Pandas, Pytorch), C, R
- **Software:** VS-Code, Proteus, LTSpice, Origin
- **Hardwares(Microcontrollers):** Arduino, ESP32, Raspberry Pi, ATmega32