MOHAMMAD RATUL MAHJABIN

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Education

University of South Florida *Tampa, FL, USA*
Doctor of Philosophy in Computer science and Engineering *Jan. 2024 - ongoing*

Islamic University of Technology (IUT) *Gazipur, Dhaka, Bangladesh*
Bachelor of Science in Software Engineering *Jan. 2019 - May. 2023*
- CGPA: 3.59

Research Interests

Natural Language Processing, Computer Vision, Machine Learning, Deep Learning, Computational Social Science, Human-Computer Interaction, Affective computing, Interdisciplinary Research, Applied ML

Publications

A Critical Analysis of Deep Learning Applications in Crop Pest Classification: Promising Pathways and Limitations *ICCIT, 2023*
Authors: **Mohammad Ratul Mahjabin**, Mohtasim Hadi Rafi, Md Sabbir Rahman, Sabbir Ahmed *(Accepted)*

A Multilingual Handwriting Learning System for Visually Impaired People *IEEE Access*
Authors: Raiyan Jahangir, Md. Wasif-Ul-Islam, Nasif Shahriar Mohim, Anika Ashraf, Nafiz Imtiaz Khan, **Mohammad Ratul Mahjabin**, Muhammad Nazrul Islam, Jungpil Shin *(Accepted)*

Research Experience

Postpartum Depression Detection *Aug. 2023 - Dec. 2023*
Research Supervisor: Dr. Muhammad Nazrul Islam, Associate Professor, Dept. of CSE, MIST, Dhaka, Bangladesh
- *Keywords— PPD, Human-computer interaction, Human-centered design, Machine learning*
- Designed and developed a screening system (mobile application) for postpartum depression
- HCI aspects incorporation in the system for better understanding
- Effective postpartum depression detection using machine learning

Alzheimer's disease detection using Domain Adaptation *Jan. 2023 - June 2023*
Research Mentor: Taki Hasan Rafi, PhD candidate, Dept. of CS, Hanyang University, Seoul, South Korea
- *Keywords— AD classification, Unsupervised domain adaptation, domain shifting*
- Proposed model to classify Alzheimer's disease using unsupervised domain adaptation
- Different acquisition plane data were considered to build a robust model
- Extensive and exhaustive experiments were performed to evaluate the model's performance

Crop Pest Identification using Deep Learning (Thesis) *Jan. 2022 - Jun 2023.*
Thesis Supervisor: Sabbir Ahmed, Assistant Professor, Dept. of CSE, IUT, Dhaka, Bangladesh
- *Keywords— Crop Pests Classification, CNN, Transfer Learning, Augmentation, Ensemble*
- Proposed a framework to recognize and classify Agricultural Pests in the wild
- Implemented various state-of-the-art CNN pre-trained models and compare results
- Combined the models using Ensemble method to enhance the performance

Professional Experience

University of South Florida *Florida, USA*
Position: Graduate Research & Teaching Assistant *Jan. 2024 - Present*
- I will design and conduct experiments in the domains of Computational social science, Affective computing and HCI under the supervision of Prof. Dr. Raiyan Abdul Baten

Military Institute of Science and Technology (MIST) *Dhaka, Bangladesh*
Position: Research Assistant *Aug. 2023 - Present*
- Worked on a research project based on the intersection of HCI and Healthcare on Postpartum Depression(PPD) Detection in the context of Bangladesh under the supervision of Prof. Dr. Nazrul Islam

Samsung R&D Institute Bangladesh *Dhaka, Bangladesh*
Position: Software Engineer Intern *May. 2022 - Sept. 2022*
- Contributed in the self diagnosis application
- Contributed in the communication and data manager module for wearable device

Technical Skills

Languages	Python • R • MATLAB • Java • C • C++ • SQL
Python IDEs	Jupyter Notebook • IPython • Spyder • VScode • Google Colaboratory
ML Frameworks	PyTorch • TensorFlow • Scikit-learn • Keras • Numpy • Pandas • Matplotlib • NLTK
Web Dev	Flask • Django • React • React Native • MongoDB • REST API

Competitions and Awards

2021 **Top 9%** , 30 Days of ML, Predicting values in a regression task   *Kaggle*

2019 **2nd Place**, Intra IUT App Idea Contest   *IUT*

Extracurricular Activity

Notre Dame Nature Study Club   *Dhaka, Bangladesh*

Position: Vice president(Publication)   *July. 2016 - Nov. 2017*

- To oversee the publication process and ensure the quality of the yearly magazine of the club

Relevant Projects

▷**HaateKhori**   *Full Stack Web Application*

ML-powered web app for early childhood education • [GitHub]   *2021*

- This project utilizes machine learning techniques to provide early education to children in an engaging and interactive way
- It aims to improve their learning experiment by adapting to individual learning styles and personalized feedbacks
- Developed With: **Python, YOLO, OpenCV, React, Node.js**

▷**COVID-CXRNet**   *Notebook*

Detecting Covid19 with Chest X Ray using CNN • [GitHub]   *Feb. 2021*

- The project implements a CNN model(ResNet18) to accurately detect COVID-19 with an accuracy of 99.98%
- Developed With: **Python, PyTorch**

▷**PySeg: A human image segmentor**   *Notebook*

Utilizes Pytorch for efficient and accurate human image segmentation • [GitHub]   *Jul. 2021*

- This aims to segment human images leveraging UNet architecture
- Developed With: **Python, PyTorch**

▷**Kishaan**   *Full Stack Web Application*

Web app for farmers to trade and prevent crop loss by identifying diseases • [GitHub] • [Live Site]   *2022*

- This project functions as a dedicated e-commerce platfor with a unique feature for identifying crop disease efficiently
- User can easily buy and sell products
- Developed With: **Python, Tensorflow, React, Node.js, MongoDB**

▷**Software Defect Prediction**   *Notebook*

Software fault prediction using machine learning • [GitHub]   *2022*

- Predicting defects in software modules, it serves as a valuable tool to ensure software quality.
- Developed With: **Python, Pandas, Numpy**

▷**FoodScan101**   *Web App*

Effortlessly identify and classify food types with a photo using image recognition technology • [GitHub]   *Apr. 2023*

- FoodScan enables users to effortlessly detect and identify different types of food simply by capturing a photo.
- Developed With: **Python, PyTorch, Flask, Numpy**

▷**ScrapeText**   *Desktop App*

A text scraping tool designed to extract articles from various online sources using Python • [GitHub]   *May. 2023*

- scraping tool designed to extract articles from various online sources. It also performs textual analysis.
- Developed With: **Python, PyTorch, Pandas, Numpy**

▷**PPD Coach**   *Mobile App*

An android application for Screening Postpartum Depression in the context of Bangladesh   *Aug - Present 2023*

- It is designed for new mothers to screen postpartum depression incorporating story-based question with visual aids
- Developed With: **Flutter, Google sheet API**

Standardized Testing

2022 **Band 7.0 (L - 7.5, S - 7, R - 6, W - 6.5)**, International English Language Testing System (IELTS)   *Bangladesh*

2023 **Total 301 (Q - 156, V - 141, AW- 4)**, Graduate Record Examinations (GRE)   *Bangladesh*