MD Tahsin Mostafiz

2917 SW 13th Street, Gainesville, Florida, 32608
tahsinmostafiz314@gmail.com | tahsin314.github.io | tahsin314 | tahsin314

Summary of Expertise

AI and Machine Learning Projects Research

- Developed deep learning models for medical image analysis and NLP tasks.
- Led development of AI tools for ICU patient assessment, object detection, and diagnostic support for various data types (e.g., text, numeric, images, GIS data).
- Co-authored multiple publications on AI applications in healthcare, including patient acuity assessment, lymph node segmentation, and diagnostic tools.

Professional Projects & Experiences

Algorithm

- Development an algorithm for small object detection in CT images using Dense Atrous Spatial Pyramid Pooling and a Spatial Context Network with Reverse Axial Attention.
- Developement of an acuity assessment pipeline for ICU patients, incorporating explainable AI algorithms to identify features contributing to the worsening of patient conditions.
- Development of a semi-supervised object detection pipeline for electric pole detection from car dashboard camera images using *Fast-RCNN* with *Resnet50* backbone and *YoloV4*.
- Co-development of a semi-supervised CNN model for abnormality detection in dairy product images.
- Backend deep learning algorithm development of **RadAssist**, a web application for the detection and localization of *Intracranial Hemorrhage* from brain CT images.

Tool

- Co-development of a flutter based android app for electric pole detection from images captured using car dashboard cameras.
- Co-development of **SemRad**, an inference tool and a class activation mapping (CAM) Tool Using *ResNet101* for Detection and Localization of Abnormalities in Chest X-ray Images for this software.
- **semDDX**, an Android app was designed to help the users navigate the vast landscape of differential diagnoses (DD) and help medical students to learn DD easily.
- **Symptom Checker** an Amazon Alexa skill was designed to help the users detect disease from symptoms.

Deep Learning Competitions

- Silver Medal in **APTOS 2019 Blindness Detection**
- Bronze Medal in **SIIM-ISIC Melanoma Classification**

Student Supervising

- Mentored an undergraduate student in his thesis work titled *"COVID Infection Analysis via Lung Lobe Segmentation using Deep Learning"*.
- Supervised two high-school students to get them familiar with research work in hardware security and machine learning under the *Student Science Training Program (SSTP)*.

Work Experience

Dept. Of BME, University of Florida — *Gainesville, FL*
OPS Student — *February, 2024 - May, 2024*

- Acuity Assessment for patients in ICU using wearable sensors.
- Mobility Assessment for early predictive analysis of patients' acuity in ICU using wearable sensors.

Dept. Of ECE, University of Florida — *Gainesville, FL*
OPS Student — *May, 2023 - February, 2024*

- Head and Neck Cancer staging via lymph node segmentation using Convolutional Neural Network (CNN) and volumetric CT images.
- Head and Neck Squamous Cell Carcinoma (HNSCC) type detection from Dual Energy CT Radiomic features.

AI Samurai Japan Limited — *Dhaka, Bangladesh*
Machine Learning Engineer — *Dec 2019- Dec 2020*

- Semi-supervised anomaly detection task with metric learning loss.
- Android application development for object detection task.
- Natural language processing (NLP) based sentiment analysis task using transformer language models.

Semion Limited — *Dhaka, Bangladesh*
Machine Learning Researcher — *March 2017- May 2019*

- Developed deep learning (DL) based models for disease classification from chest X-ray images.
- Developed Amazon echo skills and android app for differential disease analysis.

Skills

Programming Languages	C, C++, MATLAB, JAVA, Python
Libraries & Frameworks	OpenCV, BeautifulSoup, Pandas, Pydantic
Machine Learning Frameworks	Scikit-Learn, Tensorflow, Keras, PyTorch, Pytorch-Lightning, Fast.ai
Integrated Development Environment	PyCharm, Android Studio, IntelliJ IDEA, Visual Studio, Arduino, ROS
Cloud Platform	Amazon Web Services(AWS), Google Cloud Platform(GCP)
Hardware	Arduino, Raspberry Pi, AVR Microcontrollers

Education

HERBERT WERTHEIM COLLEGE OF ENGINEERING, ECE Department, UNIVERSITY OF FLORIDA *Gainesville, Florida*

MASTER OF SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING *Graduated : Spring, 2024*

- Major: Signal and Systems CGPA: **3.77/4.0**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET) *Dhaka, Bangladesh*

BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONIC ENGINEERING *Graduated : February, 2017*

- Major: Power System Minor: Electronics CGPA: **3.23/4.0**

Highlighted Publications

- "The Potential of Wearable Sensors for Assessing Patient Acuity in Intensive Care Unit (ICU)" Jessica Sena, **Tahsin Mostafiz**, Jiaqing Zhang, Andrea Davidson, Sabyasachi Bandyopadhyay, Ren Yuanfang, Tezcan Ozrazgat-Baslanti, Benjamin Shickel, Tyler Loftus, William Robson Schwartz, Azra Bihorac, Parisa Rashidi, preprint
- "Automated Segmentation of Lymph Nodes on Neck CT Scans Using Deep Learning" Md Mahfuz Al Hasan, Saba Ghazimoghadam, Padcha Tunlayadechanont, **Tahsin Mostafiz**, Manas Gupta, Antika Roy, Keith Peters, Bruno Hochhegger, Anthony Mancuso, Navid Asadizanjani, Reza Forghani, *Journal of Digital Imaging*
- "EVHA: Explainable Vision System for Hardware Testing and Assurance - An Overview" MD Mahfuz Al Hasan, **Tahsin Mostafiz**, Thomas An Le, Jake Julia, Nidish Vashistha, Shayan Teheri, and Navid Asadizanjani, Accepted at ACM JETC
- "A Web-based Assistive Tool for Emergency Physicians in Diagnosing Intracranial Hemorrhage Subtypes from 2D Brain CT Images" **Tahsin Mostafiz**, Rifat Jahan Azad, Nawsabah Noor, Shajib Ghosh, Haris Sair, Paul Nagy, Taufiq Hasan, Society for Imaging Informatics in Medicine (SIIM) 2020 Annual Meeting, June 2020, Austin, Texas, USA (abstract)
- "Pathology Extraction from Chest X-Ray Radiological Reports: A Performance Comparison" **Tahsin Mostafiz**, Dr. Khalid Ashraf