Md Sajid **Ahmed**

AI/ML Engineer · Computer Vision Engineer

1229 Man O War Place, Apt 02 Lexington, Kentucky 40504, USA

(+1) 859-913-6028 | sajid.ahmed1@northsouth.edu | sajidahmed12.github.io | sajidahmed12 | sajid-ahmed-rafi | Scholar | Deep Learning. Computer Vision.

Education

North South University — *Dhaka, Bangladesh*

B.Sc. in Computer Science and Engineering — *Jan. 2016 – Aug. 2019*

- Relevant Coursework: Pattern Recognition and Neural Networks, Natural Language Processing, Computer Organization & Architecture

Professional Experiences

Altersene Limited — *Dhaka, Bangladesh*

Machine Learning Enginner — *Oct. 2022 - Present*

- Proposed and designed an overall service architecture for industrial process automation systems in the RMG sector.
- Developed multiple machine learning models for RMG worker's activity monitoring and improved the average precision accuracy by 30 %.
- Developed a continuous CI/CD ML model validation pipeline to ensure the trained model's reliability and scalability in production.
- Built and tested semi-automated ML pipelines on distributed servers for containerized applications using Docker and Kubernetes

Fatima Fellowship, Sponsored by HuggingFace — *Oakland, California (Remote)*

Fellow Success Coordinator — *Feb. 2023 - Dec. 2023*

- Coordinated and managed comprehensive onboarding sessions for new fellows to familiarize fellows with program expectations, resources, and support systems
- Served as a primary point of contact for fellows and mentors for team building and collaboration
- Managed the allocation of computational resources (Google Colab and Cloud Storage) for fellows to facilitate their research projects and development

Dept. of CSE, North South University — *Dhaka, Bangladesh*

Lab Instructor — *Sep. 2019 - Dec. 2022*

- Prepared and delivered lab manuals for each course to conduct lab assessments in every class
- Delivered lectures on topics to grasp the knowledge of lab sessions better
- Courses Taught - CSE311L- Database Systems Lab, Computer Architecture Lab, Digital Logic Design Lab, Object Oriented Programming Lab

Research Experiences

Fatima Fellowship, Sponsored by HuggingFace — *Massachusetts, USA (remote)*

Pre-doctoral Fellow with Dr. Abdulrahman Mahmoud — *June. 2022 - August 2023*

- Proposed a new application towards emerging number formats in DNN Accelerators
- Improved performance on object detection-based networks ML runtime performance over fault injections

TnR Lab, North South University — *Dhaka, Bangladesh*

Research Assistant Intern with Prof. Tanzilur Rahman — *Nov. 2019 - Dec 2020*

- Proposed a Smartphone video-based Blood Glucose level prediction model with PPG signal processing and Biomedical Feature Engineering.
- Developed a PPG signal-based Feature Engineering algorithm to generate relevant features for the blood glucose level prediction model.
- Built a machine learning model to predict blood glucose level from human fingertip video collected from a regular smartphone camera (Paper accepted in MDPI Applied Sciences'21)

ECE Department, North South University — *Dhaka, Bangladesh*

Undergraduate Research Assistant with Prof. Mohammad Ashrafuzzaman Khan — *Aug. 2018 - April 2019*

- Proposed a FCN-based Road Segmentation Model with real-time web interface and mobile application
- Improved performance over model's accuracy with a fine-tuned ResNet50 backbone pre-trained on imagenet
- Modified pre-trained VGG16 model and used transpose convolution to upsample the images like and encoder-decoder architecture.

Teaching

Depatment of ECE, North South University *Dhaka, Bangladesh*

Undergraduate Teaching Assistant (TA) *Feb. 2019 - Aug. 2019*

- Assisting faculty members in the Digital Logic Design and Computer Architecture Course.
- Conducting tutorial sessions for students.
- Performing invigilation in exam halls.
- Evaluating home-works, assignments, and projects.

ACM R&D Group, NSU *Dhaka, Bangladesh*

Instructor *Jun. 2018 - Dec. 2018*

- Conducted weekly tutorial and lecture sessions for R&D group members and assisted students and members in their projects and presentations.

Skills

Programming Python, C/C++, Java, Bash-Script, LaTeX, Markdown

Framework PyTorch, OpenCV, NumPy, Pandas, SciPy, PIL, Matplotlib, Seaborn, Scikit-learn, Streamlet, NLTK

Web **Backend:** FastAPI, REST Framework, **Databases:** Redis Stream, ZMQ, MySQL, MongoDB, **Scraping:** Beautiful-Soap, Selenium

Utilities Git, Docker, FFMPEG, Redis-Insight, Label-Studio, MS Office, Draw.io

Languages Bangla, English

Selected Publications

Md Sajid, Ahmed*, Tanvir Tazul Islam*, Md Hassanuzzaman, Syed Athar Bin Amir, and Tanzilur Rahman. 2021. Blood Glucose Level Regression for Smartphone PPG Signals Using Machine Learning. Journal, Applied Sciences ,

Md Sajid, Ahmed*, Tasmin, M.*, Ishtiak*, T., Ruman, S. U., Suhan, A. U. R. C., Islam, N. S. and Jahan. 2020. Comparative Study of Classifiers on Human Activity Recognition by Different Feature Engineering Techniques. Conference, 2020 IEEE ICIS 2019 , **Md Sajid Ahmed***, T. Ishtiak, A. U. R. C Suhan, M.H. Anila, T. Farah. 2019. Road State Classification of Bangladesh with Convolutional Neural Network Approach. Journal, JSCI 2019 ,

T. Ishtiak*, **Md Sajid Ahmed***, M.H. Anila, S. Islam, R. Shelim, T. Farah. 2019. Road state classification of Bangladesh with convolutional neural network approach. Conference, WMSCI 2019 ,

T. Ishtiak*, **Md Sajid Ahmed***, M. H. Anila and T. Farah. 2021. A Convolutional Neural Network Approach for Road Anomalies Detection in Bangladesh with Image Thresholding. Conference, IEEE WorldS4 2019

*** denotes equal contribution**

Projects

Customer-Churn-Prediction-using-Machine-Learning [GitHub] *Dhaka, Bangladesh*

Freelance Project *Jan 2024*

- Proposed a machine learning approach towards a sample Telco customer churn IBM dataset
- Achieved 94% accuracy for predicting the number of churn customers

A Complete Road Health Monitoring System: Road Crack Detection using Instance Segmentation with Driving Assistance and Real-time Feedback [GitHub] *Dhaka, Bangladesh*

Bachelor's Thesis/Capstone Project *Summer 2019*

- Proposed an application and Real-time feedback-based model on image segmentation to detect road cracks and anomalies.
- Used YOLACT to label the pixels of a road in images.

Unsupervised Neural Machine Translation (Bangla to English, English to Bangla) [GitHub] *Dhaka, Bangladesh*

CSE495 - NLP Assignment Project *Summer 2019*

- Proposed unsupervised machine translation using monolingual corpora and trained with relevant monolingual data.
- Used fast text word embeddings to generate crosslingual translation.

ConvoCraft-AI-Powered-Dialogue-Generator-with-GPT-2-Language-Model [GitHub] *Dhaka, Bangladesh*

CSE495 - NLP Term Project *Summer 2019*

- Proposed a neural network to generate dialogues related to the characters in the Game of Thrones series.
- Used GPT-2 to generate relevant texts and used pre-generated texts to generate dialogues.

FoodAI: Real-Time Bangladeshi Food Detection with F-RCNN Object Detection Model. [GitHub] *Dhaka, Bangladesh*

Pattern Recognition Course Project *Spring 2019*

- Proposed an object detection model to detect a total of four different types of Bangladeshi Foods.
- Used TensorFlow object detection API for detection.

PPG Signal Generator from Smartphone Captured Raw Video Data [GitHub] *Dhaka, Bangladesh*

CSE498R - Directed Research *Spring 2019*

- Proposed a signal filtering algorithm from video and image processing techniques.
- Implemented a PPG signal filtering algorithm for smartphone video-generated noisy PPG signals.

Sensor Data-based Human Activity Recognition with various Feature Engineering Techniques [GitHub] *Dhaka, Bangladesh*

Data Mining Course Project *Fall 2018*

- Proposed a model to classify human activities and achieved nearly perfect accuracy (96.5).
- Used UCI Repository HAR time series data to classify human activities & with feature engineering.

Agricultural Crop Yield Prediction with Machine Learning [GitHub] *Dhaka, Bangladesh*

CSE445 - ML Course Project *Fall 2017*

- Proposed a model to predict future production of crops in Bangladesh based on the previous year's data.
- Used ten different algorithms to analyze the performance and compare to find the best approach.

An 8-bit RISC-V Microprocessor Simulator [GitHub] *Dhaka, Bangladesh*

Computer Architecture Project *Summer 2017*

- Proposed 8-bit RISC microprocessor datapath with pipeline and control units to perform several computational tasks.
- Used C++ for the simulation of assembler and logisim evolution tool for designing the datapath.

Multiple Bit Supported RISC-V Microprocessor Simulator [GitHub] *Dhaka, Bangladesh*

Self-motivated *Summer 2017*

- Proposed multi-bit RISC microprocessor datapath with pipeline and control units to perform several computational tasks.
- Used C++ for the simulation of assembler and logisim evolution tool for designing the datapath.

A Client Server based MSM Encrypted Chat Messenger Application [GitHub] *Dhaka, Bangladesh*

Java Course Project *Fall 2016*

- Proposed a simple chat client server based end-to-end chat messenger.
- Used Java Socket Programming and Java GUI.

Honors & Awards

Academic

2019 **Champion**, NSU ACM SC Capstone Innovation Challenge Season 8

2018 **2nd Runner up**, IEEDAY PES 2018 Project Showcase Competition, IEEE PES

2017 **50 % Scholarship on Tuition Fees**, Recognition of Excellent Academic Performances

Extra Curricular Activities

Vision and Language Group *Dhaka, Bangladesh*

Executive Member *April 2019*

- The group aims to foster Deep Learning research among students by conducting discussions and implementations on various Research Papers in the field of Computer Vision and NLP