Md Sajid **Ahmed**

AI/ML Engineer · Computer Vision Engineer

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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

Dept. of Computer Science, University of Kentucky

Kentucky, USA (remote)

Volunteer Research Associate with Prof. Muhammad A.B. Siddique *Oct. 2022 - Feb 2023*

- Proposed a customized dataset based on classes (intents and slots) extracted from the Schema Guided Dialogue Dataset (SGD)
- Prepared a data scrapping pipeline from the surface web with selenium and beautiful soap to improve the structure of the extracted data from the web to match with the classes of the SGD dataset

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 CNN-based Road Segmentation Model with real-time web interface and mobile application
- Improved performance over model's accuracy with ResNet50 backbone pre-trained on imagenet

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