



# 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 ENGINEER

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

## Department of ECE, North South University

### UNDERGRADUATE TEACHING ASSISTANT (TA)

- 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.

Dhaka, Bangladesh

Feb. 2019 - Aug. 2019

## ACM R&D Group, NSU

### INSTRUCTOR

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

Dhaka, Bangladesh

Jun. 2018 - Dec. 2018

## Skills

<b>Programming</b>	Python, C/C++, Java, Bash-Script, LaTeX, Markdown
<b>Framework</b>	PyTorch, OpenCV, NumPy, Pandas, SciPy, PIL, Matplotlib, Seaborn, Scikit-learn, Streamlet, NLTK
<b>Web</b>	<b>Backend:</b> FastAPI, REST Framework, <b>Databases:</b> Redis Stream, ZMQ, MySQL, MongoDB, <b>Scraping:</b> BeautifulSoup-Soap, Selenium
<b>Utilities</b>	Git, Docker, FFMPEG, Redis-Insight, Label-Studio, MS Office, Draw.io
<b>Languages</b>	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\*, Ishtiaq\*, 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. Ishtiaq, 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. Ishtiaq\*, **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. Ishtiaq\*, **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

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### 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

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### 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