

# Md Sajid Ahmed

GRADUATE RESEARCH ASSISTANT

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## Education

### PhD in CS - University of Kentucky

Lexington, Kentucky

SPECIALIZATION: GENERATIVE AI, LLMs, REINFORCEMENT LEARNING

Jan. 2026 – Aug. 2030

- **Research focus:** Large Language Models (LLMs) and diffusion language models, with an emphasis on computational efficiency and scalable training and inference.
- Supervisor: **Dr. Ruiquan Huang**, Assistant Professor, University Of Kentucky

### BSc in CSE - North South University

Dhaka, Bangladesh

SPECIALIZATION: COMPUTER VISION: INSTANCE SEGMENTATION

Jan. 2016 – Aug. 2019

- Relevant Coursework: Pattern Recognition, Machine Learning, NLP, Computer Architecture, Data Mining
- **Thesis:** Road Crack Segmentation with Driving Assistance and Real-time Feedback System [PDF]
- Supervisor: **Dr. Mohammad Ashrafuazzaman Khan**, Associate Professor, North South University

## Work Experience

### AI Engineer - AlterSense Limited

Dhaka, Bangladesh

LED COMPUTER VISION-BASED HAR SOLUTIONS FOR THE GARMENT INDUSTRY [SUPERVISOR: **DR. NABEEL**

MOHAMMED]

Oct. 2022 - July 2024

- Developed a Video Mamba-based temporal action segmentation model for untrimmed video data for video-based Human Activity Recognition (HAR) in the RMG industry, achieving **82 %** accuracy on company's in-house video dataset
- Developed an automated data collection platform using temporal object tracking on CCTV footage, reducing manual annotation and streamlining data collection.
- Developed a continuous CI/CD inference pipeline for the action recognition model in the factory's production line by leveraging the TensorRT framework to decrease GPU VRAM usage by **30%** and improve inference speed by **1.7x**.

### Lab Instructor - North South University

Dhaka, Bangladesh

UNDERGRADUATE LAB COURSE INSTRUCTOR AT THE DEPT. OF CSE

Sep. 2019 - Dec. 2022

- Designed and delivered comprehensive lab manuals to facilitate assessments during each lab session
- Conducted tutorial sessions to enhance students' understanding of the corresponding lab activities
- Taught lab courses including Database Systems, Computer Architecture, Digital Logic Design, and Object-Oriented Programming
- Evaluated course projects, invigilated examinations, and graded exam scripts and assignments

### Research Assistant Intern - TnR Lab

Dhaka, Bangladesh

BIOMEDICAL RESEARCH GROUP, NORTH SOUTH UNIVERSITY [SUPERVISOR: **DR. TANZILUR RAHMAN**]

Nov. 2019 - Dec 2020

- Designed a smartphone-based noninvasive blood glucose monitoring system using fingertip video data, Photoplethysmography (PPG) signal processing, and biomedical feature extraction techniques.
- Developed a signal preprocessing pipeline employing Gaussian filtering and Asymmetric Least Square (ALS) methods to enhance PPG signal quality and remove optical noise and motion artifacts.
- Implemented statistical machine learning models (PCR, PLS, SVR, RFR) to accurately predict blood glucose levels, achieving a low standard error of prediction (17.02 mg/dL) using Partial Least Squares Regression; research published in Applied Sciences journal.

## Volunteer Research Experiences

### Pre-Doctoral Fellow at The Fatima Fellowship, Sponsored by HuggingFace

Massachusetts, USA (Remote)

LED A PROJECT ON EMERGING NUMBER SYSTEMS IN ML SYSTEMS [SUPERVISOR: **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

## Selected Publications

- [1]. Moghis Fereidouni, **Md Sajid Ahmed\***, Adib Mosharrof, and A.B. Siddique. 2025. **Improving Multi-turn Task Completion in Task-Oriented Dialog Systems via Prompt Chaining and Fine-Grained Feedback.** (ArXiv preprint) (PDF)
- [2]. **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.** Applied Sciences, Vol. 11, Issue 2, pp. 618, MDPI. (PDF)
- [3]. Mahbuba Tasmin\*, Taoseef Ishtiaq\*, Sharif Uddin Ruman, Arif Ur Rahaman Chowdhury Suhan, NM Shihab Islam, Sifat Jahan, **Md Sajid Ahmed\***, Md Shahnawaz Zulminan, Abdur Raufus Saleheen, and Rashedur M. Rahman. 2020. **A Comparative Study of Classifiers on Human Activity Recognition by Different Feature Engineering Techniques.** 2020 IEEE 10th International Conference on Intelligent Systems (IS) (PDF)

- [4]. **Md Sajid Ahmed\***, Taoseef Ishtiaq\*, Mehreen Hossain Anila, and Tanjila Farah. 2019. **A Convolutional Neural Network Approach for Road Anomalies Detection in Bangladesh with Image Thresholding**. 2019 Third World Conference on Smart Trends in Systems Security and Sustainability (WorldS4) (PDF)

\* denotes equal contribution

## Teaching

### Undergraduate Teaching Assistant (UGA)

DEPARTMENT OF ECE, NORTH SOUTH UNIVERSITY

- Assisted faculty members in delivering course content for Digital Logic Design and Computer Architecture
- Conducted tutorial sessions to reinforce lecture materials and support student learning
- Invigilated midterm and final examinations
- Graded homework, assignments, and course projects

Dhaka, Bangladesh

Feb. 2019 – Aug. 2019

### Tutorial Instructor

ACM R&D GROUP, NSU

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

Dhaka, Bangladesh

Jun. 2018 - Dec. 2018

## Skills

<b>Programming</b>	Python, C++, Java, Bash-Script, LaTeX, Markdown
<b>AI Frameworks</b>	PyTorch, scikit-learn, Huggingface, OpenCV, Streamlit, NLTK
<b>Web</b>	FastAPI, Django Scraping: Beautiful-Soap, Selenium
<b>Databases</b>	MongoDB, Redis, MySQL
<b>Utilities</b>	Apache Kafka, ZMQ, Git, Docker, FFMPEG, Redis-Insight, Draw.io
<b>Languages</b>	English, Bengali, Hindi

## Selected Projects

### Roads360 V2: Real-Time Road Crack Detection Using Instance Segmentation [Code]

BACHELOR'S CAPSTONE PROJECT

- Developed a real-time road crack and anomaly detection system using a fine-tuned YOLACT++ instance segmentation model
- Optimized the base model for faster inference with the smaller parameter model, enabling deployment in web-based platform for monitoring live road conditions

Dhaka, Bangladesh

Summer 2019

### Dialo-GOT: Game of Thrones Dialogue Generation with GPT-2 Language Model [Code]

NLP COURSE PROJECT

- Proposed a fine-tuned GPT-2 language model to generate conversations for popular TV series named The Game of Thrones
- Generated most relevant conversations between characters that are less likely to interact in the real TV shows and achieved a 30% improvement over the regular dialogues.

Dhaka, Bangladesh

Summer 2019

### FoodAI: Real-Time Food Detection with Faster-RCNN Model [Code]

PATTERN RECOGNITION COURSE PROJECT

- Developed a custom object detection model to identify various Bangladeshi dishes (e.g., curry, biryani, etc.) from images and videos collected from social media platforms
- Implemented the model using the TensorFlow Object Detection API for real-time video inference and playback

Dhaka, Bangladesh

Spring 2019

### Sensor Data-based Human Activity Recognition with various Feature Engineering Techniques [Code]

DATA MINING COURSE PROJECT

- Developed a classification model for human activity recognition using time-series sensor data.
- Developed multiple Feature Engineering techniques and achieved a **96.5%** classification accuracy on the UCI HAR test set

Dhaka, Bangladesh

Fall 2018

## Honors & Awards

- 2019 **Champion** NSU ACM SC Capstone Innovation Challenge Season 8,
- 2018 **2nd Runner up** IEEE PES 2018 Project Showcase Competition,
- 2017 **50% tuition fee waiver recipient** in recognition of outstanding academic record for sophomore year,