Md Sajid Ahmed

GRADUATE RESEARCH ASSISTANT

329 Rose Street, Lexington, KY 40508, USA

✉ sajid.ahmed@uky.edu | ⌂ sajidahmed12.github.io | sajidahmed12 | sajid-ahmed-rafi | 🎓 Scholar

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 Ashrafuzzaman 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 **1.7×.**

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

Student Researcher - ECE Department *Dhaka, Bangladesh*

ECE DEPARTMENT, NORTH SOUTH UNIVERSITY [SUPERVISOR: DR. 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 an encoder-decoder architecture.

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 Ishtiak*, 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 Ishtiak*, 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

Dhaka, Bangladesh
Feb. 2019 – Aug. 2019

- 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

Tutorial Instructor
ACM R&D GROUP, NSU

Dhaka, Bangladesh
Jun. 2018 - Dec. 2018

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

Skills

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

Selected Projects

Roads360 V2: Real-Time Road Crack Detection Using Instance Segmentation [Code]
BACHELOR'S CAPSTONE PROJECT

Dhaka, Bangladesh
Summer 2019

- 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

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

Dhaka, Bangladesh
Summer 2019

- Proposed a fined-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 achived a 30% improvement over the regular dialogues.

FoodAI: Real-Time Food Detection with Faster-RCNN Model [Code]
PATTERN RECOGNITION COURSE PROJECT

Dhaka, Bangladesh
Spring 2019

- 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

Sensor Data-based Human Activity Recognition with various Feature Engineering Techniques [Code]
DATA MINING COURSE PROJECT

Dhaka, Bangladesh
Fall 2018

- 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

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,