

K. M. Asifur Rahman

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Experience

- July 2024 – **Machine Learning Engineer**, *Spectrum Software and Consulting(Pvt) Limited*, Karwan Bazar, Dhaka
- **GenAI**
 - Expertise in running LLM Inference Engine with fine-tuned adapters
 - Fine-tuning LLM with LORA
 - RAG based financial document validation system
 - Dynamic Knowledge base handling in RAG system
 - **Document AI**
 - ML based smart document parser for retrieving information from scanned documents.
 - **Computer Vision**
 - Human detection system in restricted area
 - Facial recognition based attendance system
 - DeepFake video generator for bypassing eKYC authentication
 - DeepFake detection system for eKYC
 - **Audio Transcription**
 - Report and summary generation from Bengali audio
- May 2023 – **Intern**, *Era InfoTech Ltd*, Purana Paltan, Dhaka
- Jun 2023 ○ Developed a transaction classifier using Natural Language Processing (NLP) tools, clustering algorithm and Python libraries.
- Elevated data analysis precision and improved model accuracy through effective collaboration with teams.
- Nov 2023 – **Intern**, *CERT, BCC*, Agargaon, Dhaka
- Jan 2024 ○ Explored an open source SIEM (Wazuh) to deploy, customizing it for a few features from an AI/ML perspective.
- May 2023 – **Director of Logistics**, *BUET Cyber Security Club*
- June 2024 ○ Successfully organized and executed a Capture The Flag (CTF) competition, showcasing adept coordination, leadership, and problem-solving skills.

Education

- Msc **Bangladesh University of Engineering and Technology**, *Department of Computer Science and Engineering*, 1st Semester
- Bsc **Bangladesh University of Engineering and Technology**, *Department of Computer Science and Engineering*, CGPA : 3.55
- College **Notre Dame College**, *Dhaka*, HSC: GPA:5.00

Online Courses and Certifications

- Neural networks and Deep learning, Improving Deep Neural networks: Hyper parameter tuning - *deeplearning.ai*
- HTML, CSS, and Javascript for Web developers - *Johns Hopkins University, Coursera*
- Python for everybody (5 course specialization) - *University of Michigan, Coursera*
- [More details](#)

Skills and Technologies

ML & AI TensorFlow, PyTorch, Scikit-learn, Hugging Face

Data Science	Pandas, NumPy, SciPy, Matplotlib, Seaborn
CV & OCR	OpenCV, Tesseract, EasyOCR, PaddleOCR, InsightFace, DeepFace, VGGFaceNet
NLP	NLTK, Hugging Face Transformers
LLM	OpenAI, Gemini, Ollama, VLLM, RAG, LangChain, Lorax, Fine tuning (Lora), Llama Factory
MLOps	MLflow, Zenml, Docker, Apisix, Azure, Firebase, MinIO
Cluster Algo	KNN, GMM, DBSCAN, Hierarchical Clustering
Languages	Python (ML/data-focused), Java, SQL, JavaScript, Bash, C++, C#
Databases	MongoDB Atlas, Oracle, MySQL, Prisma, SQLite
Others	Node.js, Express.js, RabbitMQ, Minikube, Istio

Course Projects

CSE-408 **Dynamic Document Parser**

- Tech stack: Git, CI/CD pipeline, Docker, microservice architecture, Tesseract (OCR), MongoDB, Prisma, EJS, JavaScript
- This software is designed to automate document processing by leveraging OCR technology and dynamic document templates.
- [Personal hosting](#)
- [Details](#)

CSE-472 **Anomaly Detection in ECG**

- Tech stack: Numpy, Pandas, Matplotlib, plotly, Pytorch, rnn, transformer, python
- This project uses transformer model (encoder) layer to separate healthy heart signals from unhealthy ones.
- [Details](#)

CSE-216 **Peek a Book**

- Tech stack: OracleDB, PL/SQL, Handlebars, Rest API, HTML, CSS
- PeekAbook is an online book buying site where one can find various bookshops and buy books from those shops.
- [Details](#)

CSE-108 **Online Car Shop**

- Tech stack: Java, JavaFX, threading, Network tools, SQLite
- This project simulates an online car shop using the network module of Java and SQLite database. Implemented with threading.
- [Details](#)

Projects

Climate Report generation from Bengali Audio

- Tech stack: Facebook M4tv2 model, Gemini 2.0, Pydantic, Pandas
- This project aims to generate pdf report from Bangla audio (calamity description). Motivated to add regional language support in the future.
- [Details](#)

Gender Inequality and Climate Change Analysis

- Tech stack: Numpy, Pandas, Matplotlib, Sklearn, Tensorflow
- This project explores the relationship between gender inequality and climate change. The analysis leverages various data visualization and data manipulation libraries in Python to provide insights into how these two critical issues intersect. This was crafted to participate in the Nasa Space Apps Challenge, 2024 competition.
- [Details](#)

Voice-Enabled Android Assistant (Listener)

- Tech stack: Google APIs (voice to text, location), Android Studio, Java
- My first Android app. Call, message, and many things done on voice command.
- [Details](#)

3D Solar System

- Tech stack: Java, JavaFX, threading, 3D animation
- This Java application utilizes JavaFX to create a visually engaging 3D model of the solar system.
- [Details](#)

Platformer Game (Java)

- Tech stack: Java
- Cool Platformer Game. Check the video demo on README.md.
- [Details](#)

Research

5GPT: 5G Vulnerability Detection by Combining Zero-Shot Capabilities of GPT-4 with Domain Aware Strategies Through Prompt Engineering, *Accepted in IEEE T-IFS Journal*

- We utilized GPT-4's advanced language understanding to detect vulnerabilities directly from 5G specifications. Testing promising cases using Open5GS and UERANSIM. We first adopted a zero-shot approach, then a domain-aware strategy, where we explicitly teach GPT-4 about security properties and hazard indicators. We found 47 potential issues 27 of them was previously unreported. Confirmed 9 vulnerabilities, simulating 14 test cases.

5G RAG Based Conformance Testing, *On Going*

- We proposed a fully automated end-to-end framework that utilizes a Retrieval-Augmented Generation (RAG) pipeline. Our approach grounds LLM outputs in verified, domain-specific data to minimize hallucinations, and overcomes cross-section dependency challenges by integrating a robust context retrieval mechanism. Using this approach, we have generated 800 conformance test-cases for essential 5G mobility management procedures in under 3 hours. Overall, our framework offers a scalable, reliable, and robust solution for automating compliance testing in complex, ever-changing domains like 5G and beyond.

Exploring Post-Mortem Neural Signal Processing: Uncovering Computational Potentials in Deceased Animal Brains, *Student Poster Champion NSysS 2021*

- We investigate the potential of a deceased animal brain to process signals. Specifically, we examine the brain's responses to external stimuli in the form of electrical signals and its ability to act as a memory unit. We also explore the transfer characteristics of the deceased goat brain and elucidate the corresponding function through representative circuits

Assessing the Impact of Temperature Change on Discomfort Index: Temporal Trends and Seasonal Variations in Dhaka City, *ICWFM 2025*

- This study analyzed the temporal trends and seasonal variations in maximum temperature, minimum temperature, average temperature, and discomfort index in Dhaka city from 1981 to 2020. The discomfort index calculated using Thom Discomfort Index equation and employs a combination of statistical techniques to assess the impact of temperature changes on the discomfort index.

Awards and Achievements

- 2022 Finalist at WICC (Water Innovation Challenge Competition)
- 2021 Champion Student Poster at International Conference on Networking System and Security (NSysS)
- 2018 Government scholarship awarded by Dhaka Education Board for brilliant academic performance in Higher Secondary Certificate public exams
- 2016 Government scholarship awarded by Rajshahi Education Board for brilliant academic performance in School Secondary Certificate public exams
- 2023 Inter Faculty Cricket Tournament Runner-up

References

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