

Aranya Saha

✉ aranyasaha932@gmail.com

☎ +8801531531335

🌐 Website

in Aranya Saha

🔗 thisisAranya

Research Interests

Multimodal Learning | Reinforcement Learning | Trustworthy and Efficient AI | Image & Video Processing | AI in Healthcare

Education

BSc Bangladesh University of Engineering and Technology

March 2025

Department: Electrical and Electronic Engineering

Major: Communication and Signal Processing

◇ **CGPA: 3.87/4.00** **Rank:** 3rd in CSP Major (Top 5%)

◇ **Relevant Coursework:** Microprocessor and Embedded Systems, Wireless Communication, Artificial Intelligence and Machine Learning, Random Signals and Processes, Communication Systems, Digital Signal Processing, Probability and Statistics, Computer Programming, etc.

Publications

* = Equal Contribution, [P] = Preprint, [C] = Conference, [J] = Journal

1. [P] I. N. Swapnil*, **A. Saha***, T. A. Khan*, M. A. Haque, "GRPO++: Enhancing Dermatological Reasoning Under Low-Resource Settings", Under Review at *IEEE Journal of Biomedical and Health Informatics*. [\[Preprint\]](#)
2. [P] **A. Saha***, T. A. Khan*, I. N. Swapnil*, M. A. Haque, "CLARIFY: A Specialist-Generalist Framework for Accurate and Lightweight Dermatological Visual Question Answering", Under Review at *IEEE Transactions on Human-Machine Systems*. [\[Preprint\]](#)
3. [P] T. A. Khan, **A. Saha**, I. N. Swapnil, M. A. Haque, "Compression Strategies for Efficient Multimodal LLMs in Medical Contexts", Under Review at *Journal of Signal Processing Systems (Springer)*. [\[Preprint\]](#)
4. [C] S. Sobhan, **A. Saha**, T. A. Khan, A. Zami, "Skin Cancer Classification Using Pre-trained CNNs: A Transfer Learning Approach Addressing Imbalanced Data Challenges", published at the 2nd Int'l Conf. on Next-Gen Computing, IoT and Machine Learning (NCIM), June 2025. [\[Link\]](#)
5. [C] S. Sobhan, A. Zami, M. Ahmed, T. M. Zihan, T. A. Khan, **A. Saha**, "A Multi-Stage Deep Learning Approach to Tuberculosis Detection with Explainable Insights", published at the 2nd Int'l Conf. on Next-Gen Computing, IoT and Machine Learning (NCIM), June 2025. [\[Link\]](#)

Research Experience

Development of a Multimodal Medical Assistance Chatbot for Domain-Specific Applications

Dhaka, Bangladesh

Undergraduate Research

Nov 2023 Mar 2025

- ◇ Developed a dermatology chatbot by fine-tuning a vision-language model on Dermnet, leveraging GRPO/DPO for reasoning, DINOv2 and KG-based RAG for precision, and structured pruning for efficiency.
- ◇ *Research Supervisor:* Dr. Mohammad Ariful Haque, Professor, EEE, BUET *Presentation:* [Slides](#)

Selected Projects

EchoLens: Multimodal Conversational AI Engine

[GitHub](#)

- ◇ A FastAPI-based multimodal engine integrating SmoVLM for vision-language reasoning, OpenAI Whisper for speech-to-text, and pyttsx3 for text-to-speech with persistent conversational memory.

Simple MedQA-GPT: GPT Tailored for Medical Q&A

[GitHub](#)

- ◇ A fine-tuned GPT-2 model trained on a custom medical JSONL dataset using Hugging Face Trainer and deployed as a Dockerized REST API via FastAPI for clinical question-answering.

Autonomous Delivery Drone for Remote and Inaccessible Areas

[Report](#)

- ◇ An autonomous quadcopter utilizing an APM 2.8 flight controller with GPS waypoints programmed

via MissionPlanner, designed to deliver shock-absorbed payloads of up to 700g.

MATLAB-Based Fingerprint Recognition System

[GitHub](#) [Report](#)

- Executes fingerprint identification via minutiae-based matching, employing a pipeline of Fourier Transform enhancement, locally adaptive binarization, and an iterative parallel thinning algorithm.

Competition

1st Runner Up - Poster Competition (AI)

Poster Title: *AI-Powered Dermatological Assistant: Bridging Healthcare Gaps Through Multimodal Intelligence* [\[Poster\]](#)

BEAR Summit - Bangladesh National Semiconductor Symposium 2025 [\[Certificate\]](#)

Professional Experience

Advanced Chemical Industries Ltd. [\[Website\]](#)

Machine Learning Engineer

Dhaka, Bangladesh

Apr 2025 - Present

Office Projects:

- CV Sorter:** LLM-Powered automated CV evaluation system for scoring candidates.
- Insight Explorer:** LLM-powered analysis of tabular data to uncover trends and patterns.
- Bangla OCR:** Conversion of printed and handwritten Bengali text into machine-readable format.
- AI-powered generic drug formulation:** An AI platform at ACI Healthcare to accelerate generic drug development, and reduce manual effort. [\[Ongoing\]](#)

Extracurricular Experience

Robotics Bootcamp 2025 [\[Website\]](#)

Instructor, Institute of Robotics and Automation, BUET

Dhaka, Bangladesh

June 2025

- Delivered a lecture on [PID Control for Robotics](#), introducing feedback control fundamentals, PID components, and tuning methods with practical analogies.

Association for Computing Machinery (ACM) [\[Website\]](#)

Student Executive, ACM SIGCOMM

Remote

Apr 2024 - Feb 2025

- Appointed as the first-ever Student Executive, working with [Dr. Matthew Caesar \(UIUC\)](#) to lead global networking initiatives, develop the [official SIGCOMM website](#), and co-found the SIGCOMM paper reading group where I presented research.

Technical Skills

- Hardware:** Microcontrollers, IoT Devices, Sensors.
- Programming:** Python, MATLAB, C/C++, Pandas, NumPy.
- ML/DL/NLP:** PyTorch, TensorFlow, Hugging Face Transformers, CNNs.
- DevOps & Tools:** Docker, FastAPI, Git, LaTeX, Microsoft Office.

Honors and Awards

- University Merit Scholarship** (4 semesters) BUET, for outstanding academic performance
- Dean's List Award** (Years 1-2) BUET, for high cumulative GPA achievement
- 29th Rank out of 10,000+** candidates in BUET Undergraduate Admission Test (2019)
- 31st Rank (Male Category) out of 300,000+** in Dhaka Board HSC; **Talent Pool Scholarship** recipient with 96.83% in Physics, Chemistry, Mathematics and 91.15% overall
- Perfect Attendance Certificate** Notre Dame College, for flawless attendance during Classes 11-12

References

Mohammad Ariful Haque, PhD [\[Profile\]](#)

Professor, Department of EEE

Bangladesh University of Engineering and Technology

Email: arifulhoque@eee.buet.ac.bd

Relationship: Thesis Supervisor

Quazi Deen Mohd Khosru, PhD [\[Profile\]](#)

Professor, Department of EEE

Bangladesh University of Engineering and Technology

Email: deen@eee.buet.ac.bd

Relationship: Academic Advisor