

résumé of A F M Mahfuzul Kabir

mahfuzulkabir.com | afmmahfuzulkabir@gmail.com | [LinkedIn](#) | [GitHub](#) | [Google Scholar](#)

RESEARCH INTEREST

Generative AI (Diffusion & Stable Diffusion models) | Natural Language Processing | Differential Privacy in AI

EDUCATION

New Jersey Institute of Technology (NJIT)

Doctor of Philosophy (Ph.D) in Data Science

(September 2025 - Present)

GPA: 4.00/4.00

Bangladesh University of Engineering & Technology (BUET)

Bachelor of Science(B.Sc.) in Electrical & Electronic Engineering (EEE)

(March 2018 - May 2023)

Major: Communication & Signal Processing (CSP)

CGPA: 3.67/4.00

RESEARCH EXPERIENCE

- 1. New Jersey Institute of Technology (NJIT), New Jersey, USA** 2025 - Present
Graduate Research Assistant,
Principal Investigator: *Dr. Lingxiao Wang*
 - Exploring differential privacy with theoretical guarantees with diffusion models for image, speech, and natural language generation. Our goal is to use the inherent noise existing in the denoising process of diffusion models to ensure privacy through formal guarantees and empirical experiments. Our work has been published in CVPR 2026 as a poster and has been granted award for the best real-world impact research at NJIT AI Exploration Day.
- 2. Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh** 2022 - 2023
Undergraduate Student Researcher,
Principal Investigator: *Dr. Mohammad Ariful Haque*
 - Explored natural language understanding for low-resource languages like Bengali.
 - Developed multilingual virtual agent capable of communicating and performing tasks at request.
 - Awarded RISE Student Research Grant Award for impactful research.

PUBLICATIONS

* Indicates equal contribution

- 1. Personalized Federated Training of Diffusion Models with Privacy Guarantees**
K K Patel*, B Jiang*, **A F M M Kabir***, W Zhang, D Zou, L Wang
TL;DR: A federated framework for diffusion models that enables cross-client collaboration with formal differential privacy guarantees and strong protection against attacks.
CVPR 2026 (Poster)
- 2. mTOVA: A Multilingual Task Oriented Virtual Assistant for Human Computer Communication**
S H Ujjal*, **A F M M Kabir***, M A Haque
IEEE ICTP 2023 [[Paper](#)]

PROFESSIONAL EXPERIENCE

ACI Limited | Dhaka, Bangladesh

Machine Learning Engineer

(October 2023 - August 2025)

- Developed **ACI SpeechHub**, a meeting transcription system using ASR and NLP technologies.
 - Training and development of Bengali ASR model using **Whisper Medium** for transcription of Bangla audio.
 - System development and optimization for transcription service using **WhisperX**, **FlashAttention** and **Uvicorn**. Meeting automation system integrating transcriber and **PyAnnote Speaker Diarization**.
 - Development of dialogue summarization model for summarizing meeting minutes and **keyword spotting** using **Levenshtein Distance** from transcription.
- Developed **ACI Central Intelligence**, a generalized system for self-hosted small language models with low-resource usage features.
 - Use **llama-cpp** and **VLLM** to host models in on-prem server.

- Customize and update llama-cpp to be used with latest models (Gemma) with multimodal features using **multimodal projection**.
- Quantization and host of heavy models (**Qwen 32B, Phi-4 14B**) in single 24GB GPU.
- Develop on-demand resource usage for the system by efficient MLOps.
- Developed **HR Management Development Plan** for **ACI HR Agentic Hub**
 - Developed backend workflow powered by ACI Central Intelligence to introduce agentic workflow in Management Development Plan generation.

10 Minute School | Dhaka, Bangladesh | Part-time

Academic Content Creator & Instructor

(June 2021 - May 2022)

POSTERS & PRESENTATIONS

1. **Personalized Federated Training of Diffusion Models with Privacy Guarantees** April 2026
Presented research progress at the *NJIT AI Exploration Day 2026* [\[Link\]](#)
2. **mTOVA: A Multilingual Task Oriented Virtual Assistant for Human Computer Communication** Dec-2023
Oral presentation at the *2023 IEEE International Conference on Telecommunications and Photonics (ICTP)*.
3. **Development of an end-to-end voice controlled multilingual conversational agent using deep learning and natural language processing.** [\[Poster\]](#) 2023
Poster presented for the *RISE Student Research Grant 2022*.

GRANTS AND SCHOLARSHIPS

1. Recipient, **CVPR2026 Broadening Participation Award** 2026
Received award and stipend for attending CVPR 2026 conference.
2. Recipient, **Graduate Award for Real-World Impact Research** 2026
Award for the most real-world impact research presentation at the NJIT AI Exploration Day.
3. Recipient, **RISE Student Research Grant** 2022
Research grant by the Research and Innovation Centre for Science and Engineering (RISE), BUET.
4. Recipient, **Dean's List Scholarship** 2018 - 2019
Academic honor by BUET for achieving outstanding grades for two consecutive terms.
5. Recipient, **Undergraduate Admission Test Excellency Award**
Awarded by BUET for an excellent result in the BUET undergraduate admission test.
6. Recipient, **Govt. General Scholarship in Higher Secondary School Certificate Examination** 2017
Awarded by Ministry of Education, Bangladesh

COMPETITIONS

1. Finalist, **Robi Datathon 3.0** 2024
Ranked among the **Top 10** finalists in the country's largest data science competition.
2. 1st Runner Up, **IUT National ICT Fest 2024 Datathon: ASR for Regional Dialects** [\[Leaderboard\]](#) 2024
Kaggle competition organized by IUT Computer Society for ASR for Bengali regional speech data.
3. 1st Runner Up, **ML Competition - CUET ETE Day 2023.** [\[Leaderboard\]](#) 2023
Kaggle competition organized by Dept. of ETE, CUET for book genre classification using NLP.
4. Bronze Medal (59th internationally, 4th in Bangladesh), **Bengali.AI Speech Recognition.** [\[Leaderboard\]](#) 2023
International Kaggle competition for recognizing Bengali speech from out-of-distribution audio recordings.

TECHNICAL SKILLS

Programming Languages and Development: Python | C/C++ | Assembly Language | LaTeX

Deep Learning Frameworks: PyTorch | TorchAudio | TorchVision | Huggingface Transformers & Diffusers | Scikit-Learn

Cloud Services and Frameworks: Amazon EC2 Services | Microsoft Azure | Amazon Sagemaker

DevOps and Database: FastAPI | Qdrant | Uvicorn | RestAPI

HIGHLIGHTED PROJECTS

1. **Custom Implementation of Paper: (CSTA) Spatial-Temporal Causal Adaptive Learning for Exemplar-Free Video Class-Incremental Learning** [\[GitHub\]](#)
A custom implementation of the IEEE TCSVT 2025 paper on **video continual learning**. The project implements the extremely complex and adaptive architecture of the CSTA paper, as well as very intricate training process and evaluation. This was done as part of a course project for my first year PhD studies.
2. **Bangla NLP Toolkit.** [\[PyPi Package\]](#)
Open-source PyPi package for efficient Bangla text preprocessing, including addressing inconsistencies in Bangla Unicode system. The package has been downloaded over **70k times** since release.
3. **CleanUNet-based Audio and Speech Denoiser.** [\[GitHub\]](#)
The system mitigates resource inefficiency inherently existing in NVIDIA's CleanUNet implementation by using a two-stage batching mechanism. It has been **downloaded 3000 times since published**.
4. **Multilayer Perceptron (MLP) in C++** [\[GitHub\]](#) *In Progress*
Aiming to build MLP layers in C++ from scratch, starting from the building blocks (n-dimensional array). The goal of this project is to gain better mathematical insight from a practical and programming point of view.

VOLUNTARY ACTIVITIES

President, BUET Journalist Society	(2021 - 2023)
Program Committee Chair (Previously Design Lead), IEEE BUET Student Branch	(2021 - 2023)
Chairperson (Previously Treasurer), IEEE IAS BUET SB Chapter	(2021 - 2023)
Founding Member & Public Relations Chair, BUET Optical and Photonics Society	(2021 - 2022)
Logistics Secretary, BUET Debating Club	(2020 - 2022)

REFERENCES

Dr. Lingxiao Wang

Assistant Professor, Department of Data Science
New Jersey Institute of Technology
Email: lw324@njit.edu

Dr. Mohammad Ariful Haque

Professor, Department of EEE
Bangladesh University of Engineering and Technology
Email: arifulhoque@eee.buet.ac.bd