MD Ajmain Mahtab

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Education

BRAC University Sept 2020 – Jan 2025

B.S. Computer Science, Mathematics minor | ***GPA**: 3.95/4.0* *Credits: 151.0*

- **Honors**: Graduated with highest honors, Vice Chancellor's List

The Aga Khan School, Dhaka July 2003 – May 2020

A Levels: GPA: 4.25/5.0 — O Levels: GPA: 5.0/5.0

Experience

Adjunct Lecturer July 2025 – October 2025

BRAC University *Dhaka, Bangladesh*

- Taught 7 sections (˜280 students total) on **Programming Language 1 (CSE110)**, **Programming Language 2 (CSE111)**, **Data Structures (CSE220)**, and **Compiler Design (CSE420)**
- Developed an novel AI model to classify red blood cells, which is currently under review in a journal

Mathematics Instructor September 2025 – Present

Binary Institute *Dhaka, Bangladesh*

- Teaching IBDP mathematics: Standard Level and Higher Level
- Designing and evaluating examinations

Research Assistant Mar 2025 – Present

Independent University, Bangladesh *Dhaka, Bangladesh*

- Developed a novel AI model to detect tuberculosis using histopathological data which got accepted in the CCE conference
- Supported various thesis projects across departments

Student Tutor - Game Theory Oct 2024 – Jan 2025

BRAC University *Dhaka, Bangladesh*

- Assisted students via 1-on-1 sessions
- Graded assignments
- Led consultations for two Game Theory sections

Blender Instructor June 2021

BRACU Robotics Club *Dhaka, Bangladesh*

- Taught Blender covering modeling, modifiers, shaders, particle system, and rendering
- Guided students in creating and submitting their own scenes

App Developer Oct 2018 – Apr 2019

Raphael Teaches *Remote*

- Developed an educational mobile application for O/A Level students with features such as MCQ interface, study materials, and videos
- Built the front-end using **Java** and **XML** for a responsive user experience
- Integrated **Firebase** for authentication, push notifications, and real-time database support

Projects

Youtube Clone

- Recreated Youtube using **React.js** components and custom **CSS styling**
- Integrated the **YouTube API** to fetch and display dynamic content directly from YouTube

Next Commerce

- Engineered an e-commerce platform with **Next.js** and **vanilla CSS**
- Integrated **Stripe** for secure payment processing, product database, and inventory management solution

Spotify Clone

- Built with **React.js** and **vanilla CSS**

- Integrated stock assets and implemented key UI components to replicate core streaming app functionality.

Intended Sarcasm Detection in English
- Used **BERT-base** to classify sarcasm in text; achieved F1-score of 0.6529
- Outperformed winning competition score of 0.6052

Maze Game
- Created an **OpenGL** game where players travel through a maze to reach an objective while avoiding different types of enemies.
- The maze is randomly generated using **DFS**, so it is a new maze every time the game reloads.

3D Model of Shiganshina
- Created a detailed 3D model of Shiganshina, a fictional city from *Attack on Titan*, using **Blender** and **Geometry Nodes**
- Applied textures and lighting; rendered the final scene using the **Cycles** rendering engine

Technical Skills

Programming Languages: Python, Java, C++, C#, R, JavaScript, HTML/CSS, SQL
Frameworks & Libraries: TensorFlow, Keras, PyTorch, React, Next.js, Node.js, Express
Tools & Platforms: n8n, Langflow, Firebase, MongoDB
AI & Machine Learning Domains: NLP, Computer Vision, Explainable AI
Software: Blender, Unreal Engine, Unity

Research Work

SensaNet: A Lightweight DL Model for Tuberculosis Detection in Histopathological Images Published
- Developed SensaNet, a novel light-weight deep model optimized for reliable detection of AFB in microscopic images, enabling deployment in low-resource clinics
- Exhaustive comparison of SensaNet with five best-performing CNN models (DenseNet, ResNet, VGG19, MobileNetV2, EfficientNetB0) on different performance metrics
- Applied SensaNet to different datasets (lung cancer, parasite image classification) and proved that it has great performance for binary, multi-class, and complex classification problems in histopathology

RAINet Pending
- Proposed **RAINet**, an involution architecture based model, optimised for red blood cell classification
- Achieved **98.5% accuracy**, **0.985 F1-score**, and **0.983 Matthews correlation** on the Blood Cells dataset, outperforming ResNet50 (91.7%), VGG19 (92.9%), and MobileNetV2 (97.7%)
- Demonstrated efficiency with only **1.76M parameters** and **6.3 MB model size**, compared to ResNet50's 23.6M parameters and 90 MB size
- Validated generalisation on multiple datasets (Malaria, ALL cancer, Leishmania/Plasmodium/Babesia parasites), achieving up to **99.0% accuracy** on 8-class parasite classification

Bangla Natural Language Inference
- Created the first human-annotated Bengali Natural Language Inference (NLI) dataset to aid semantic understanding of the language
- Trained state-of-the-art models and evaluated performance on the dataset
- Analyzed for spurious patterns to confirm semantic learning over heuristic exploitation

Achievements

- Runners-up - NLP Hackathon by BdOSN and Bangla.gov.bd (2023)
- Country Highest - AS IT (2019)
- Country Highest - IGCSE Computer Science (2018)
- Duke of Edinburgh's Award - Silver Standard (2017)
- Merit and Academic Scholarships - BRAC University (2020–2024)
- Third - Bangladesh Math Olympiad Regional Round 2018
- Daily Star Award (2018)
- Bangladesh Informatics Olympiad National Round (2020)
- Bangladesh Math Olympiad National Round(2017–2019)