

# MAMUN MAHMUD

AI/ML Researcher | Federated Learning | Computer Vision | Medical Imaging

📍 Chattogram, Bangladesh    ✉️ mamunmahmud756@gmail.com    ☎️ +880 1854-496276

🌐 LinkedIn    🐙 GitHub

## Professional Summary

Computer science student focused on federated learning, optimization techniques, privacy-preserving AI, and medical image analysis. Recent work spans comparative deep-learning studies for liver ultrasound, histopathology, and diabetic retinopathy, with strong emphasis on non-IID optimization, adaptive regularization, model benchmarking, and explainable modeling. Also brings competitive-programming experience and mentoring experience through teaching assistance, bootcamp coordination, and AI training work.

## Research Interests

- Federated learning and optimization techniques under heterogeneous and non-IID data distributions.
- Privacy-preserving medical image analysis in ultrasound, histopathology, and retinal imaging.
- Deep learning benchmarking, adaptive optimization, and communication-efficient training.
- Explainable AI for clinically meaningful decision support.

## Technical Skills

*Programming Languages:* C++, Python, JavaScript

*Web Development:* Django, ExpressJS, React, NodeJS, Tailwind CSS

*Databases:* PostgreSQL, MongoDB

*AI / Computer Vision:* PyTorch, OpenCV

*Tools:* Git

*Languages:* English (Professional Working Proficiency), Bangla (Native or Bilingual Proficiency)

## Education

### B.Sc. in Computer Science and Engineering

International Islamic University Chittagong

2022 – 2025

CGPA: 3.91 / 4.00

- Ranked 1st in the Batch and among the Top 1% of the Department

## Experience

### Teaching Assistant — Competitive Programming 2 (CSE) & C Programming (EEE)

Autumn 2025 – Spring 2026

International Islamic University Chittagong

IIUC

- Supported students in algorithmic problem solving, contest preparation, and core competitive-programming concepts for the CSE department.
- Assisted labs and guided EEE students in C programming fundamentals, debugging, and structured problem solving.
- Provided mentoring, explanations, and hands-on support to help students strengthen programming and problem-solving skills.

### Bootcamp Coordinator & Problem Setter

Spring 2025

IIUCCPS

IIUC

- Coordinated bootcamp activities, designed practice problems, and helped participants build confidence in contest-style thinking.
- Contributed to contest preparation by creating problems and supporting beginner-to-intermediate learners.

### AI Chatbot Trainer and Response Evaluator

Jan. 2025 – Jun. 2026

Outlier (ID : 66ff091f0084d84dba0ab8a3)

Remote

- Trained and reviewed chatbot responses to improve quality, correctness, and usefulness in code- and reasoning-related tasks.
- Provided feedback to refine output quality and response behavior across diverse prompts.

## Selected Projects

### Resources Management

[Live](#) | [GitHub Link](#)

*PostgreSQL, ExpressJS, ReactJS, NodeJS*

- Built a department-level platform for the IIUC CSE community to simplify access to routines, schedules, course materials, classroom reservations, bus information, and faculty contacts.
- Enabled class representatives to update class schedules and allowed teachers to view assigned routines, making the system practical for everyday academic coordination.
- Designed as a full-stack solution with clean data flow and a user-friendly interface for both students and teachers.

### IIUC Computer Club

[Live](#) | [GitHub Link](#)

*HonoJS, TypeScript, Drizzle ORM, PostgreSQL*

- Project Lead and Backend Developer
- Developed a backend API to manage club member data and support campus activities with a structured and scalable database workflow.
- Focused on maintainable API design, organized data handling, and efficient backend support for club operations.

## Bus Management

[GitHub Link](#)

Django REST API, ReactJS, PostgreSQL

- Built a bus-service management system that helps administrators monitor bus statistics, track operational performance, and manage bus allocation.
- Designed the system to support data-driven assignment and improve the management of transport-related resources.

## ShowMe Messaging App

[GitHub Link](#)

MongoDB, ExpressJS, ReactJS, NodeJS

- Developed a messaging application with true end-to-end encryption, using a frontend-handled secret key to encrypt messages.
- Focused on private communication and secure message handling within a modern full-stack architecture.

## Research & Publications

---

### Accepted / Published

1. **Mamun Mahmud**, Muhammad Muhtasim Shahriar, MD. Najmus Sakib, and Ferry Wahyu Wibowo.  
"Development and Comparative Analysis of Deep Learning Models for Multiclass Classification of Liver Conditions in Ultrasound Imaging."  
2025 5th International Conference of Science and Information Technology in Smart Administration (ICSINTESA), Yogyakarta, Indonesia, 2025, pp. 281–286, doi: 10.1109/ICSINTESA68165.2025.11413762.
2. **Mamun Mahmud**, Md. Najmus Sakib Rafi, Md. Rayhan Uddain, Ts. Dr. Goh Kah Ong Michael, Nafiz Fahad, Riadul Islam Rabbi, Ekramul Haque Tusher, Fatema Mostafa Tarin, and Ts. Dr. Tee Connie.  
"Privacy-Preserving Federated Deep Learning for Multi-Class Liver Fibrosis Staging from Ultrasound Images."  
Accepted for publication / Camera-ready submitted.

### Under Review / Submitted

1. Muhammad Muhtasim Shahriar, **Mamun Mahmud**, and M. F. Mridha.  
"Federated Deep Learning for Privacy-Preserving Multi-Class Histopathology Image Analysis."
2. **Mamun Mahmud** et al.  
"Prediction and Detection of Liver Diseases Using Machine Learning and Deep Learning."  
Manuscript under review.
3. A. K. M. Shahriar Emtiaz, M. M. Golam Hafiz, **Mamun Mahmud**, Muhammad Muhtasim Shahriar, and Md. Kishor Morol.  
"HistoSwIn-BTNet: A Boundary- and Texture-Guided Swin Transformer Network for Binary Nuclei Segmentation in Histopathology."  
Submitted, AIHA 2026 Workshop under ICPR 2026.

### Ongoing

1. **Mamun Mahmud** and M. F. Mridha.  
"Adaptive Gradient-Drift-Aware FedProx for Communication-Efficient Federated Learning on Heterogeneous Medical Imaging Data."  
Ongoing. Developing a gradient-drift-aware adaptive FedProx method with automatic proximal-coefficient adjustment and client-side regularization for heterogeneous federated learning. Evaluating the approach on five medical imaging datasets under realistic non-IID settings with emphasis on convergence behavior, communication efficiency, and robustness against client overfitting.

## Highlights

---

- ICPC Dhaka Regional Onsite 2025 – 29th Place [sorry\\_IUC](#)
- Bootcamp Autumn '25 Intra-University Team Programming Contest – Champion [sorry\\_IUC](#)
- CoU IUPC 2024 – 2nd Place [IIUC\\_MarkUs](#)
- Programming Hero National Hackathon EWU 2024 – 4th Place [Team\\_Alpha](#)
- IIUC IUPC 2025 – 6th Place [sorry\\_IUC](#)
- ICPC Dhaka Regional 2024 – Participant [IIUC\\_MarkUs](#)
- BUET IUPC 2024 – Participant [IIUC\\_MarkUs](#)
- NCPC Bangladesh 2023 – Participant [IIUC\\_MarkUs](#)
- Codeforces Specialist – Max Rating: 1523, 1700+ Problems Solved [Competitive Programming](#)

## ECA and Certification

---

### Extra-Curricular Activities

- **IIUC Computer Club – Innovation & Tech Secretary** [Autumn 2025 - Spring 2026](#) [\[Digital Copy\]](#)
  - Part of the organizing team for the Programming Hero Present NextGen Inter University Hackathon.
  - Team Lead for the 2025 intra-department Tech Hackathon.
  - Project Lead and Backend Developer of the IIUC Computer Club website.
- **IIUC Competitive Programming Society – Bootcamp Coordinator & Problem Setter** [Spring 2025](#) [\[Digital Copy\]](#)
  - Conducted classes during the Spring 2025 bootcamp.
  - Set problems for contest preparation and practice sessions.

### Certifications

- PU-CSE IT Fest 2024 – Programming Contest Participant [Digital Copy]
- CUSS IT Fiesta 2024 – Active Participant [Digital Copy]
- Python (Django) Training (80 Hours) – EDGE Project [Digital Copy]
- EWU National RoboFest 2024 – National Hackathon Participant [Digital Copy]
- IIUC Tech Fest 2025 – Deep Learning Seminar Participant [Digital Copy]
- ICPC Asia Dhaka Regional Contest 2024 – Contestant [Digital Copy]
- ICPC Asia Dhaka Regional Contest 2025 – Honorable Mention [Digital Copy]
- CUET Inter University Programming Contest (inCSEption 2025) – Participant [Digital Copy]