Md Muhaiminul Islam Nafi

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Education

- **Bangladesh University of Engineering and Technology** — Dhaka, Bangladesh
  M.Sc. in Computer Science and Engineering — *2025-present*
- **Bangladesh University of Engineering and Technology** — Dhaka, Bangladesh
  B.Sc. in Computer Science and Engineering — CGPA: 3.97/4.00 — *2020-2025*
- **Notre Dame College** — Dhaka, Bangladesh
  HSC — GPA: 5.00/5.00 — *2017-2019*
- **Motijheel Govt. Boys' High School** — Dhaka, Bangladesh
  SSC — GPA: 5.00/5.00 — *2015-2017*

Work Experience

- **United International University (UIU)** — Dhaka, Bangladesh
  Lecturer — Department of Computer Science and Engineering — *2025–Present*

Research Experience

- **Predicting C- and S-linked Glycosylation sites from protein sequences using protein language models**
  Published in Q1 journal
  - **Overview**: Developed a hybrid deep-learning architecture to predict C- and S-linked glycosylation sites from protein sequences using protein language model embeddings and contextual information.
  - **Publication**: Link to article
- **StackGlyEmbed: Prediction of N-linked Glycosylation sites using protein language models**
  Published in Q1 journal
  - **Overview**: Proposed StackGlyEmbed, a model that predicts N-linked glycosylation sites from protein sequences by leveraging protein language models with window and per-residue features.
  - **Publication**: Link to article
- **ResLysEmbed: A ResNet-Based Framework for Succinylated Lysine Residue Prediction Using Sequence and Language Model Embeddings**
  Published in Q1 journal
  - **Overview**: Developed a hybrid deep-learning architecture incorporating protein language models to identify succinylated lysine residues. Link to article
- **NFEmbed: Modeling Nitrogenase Activity via Classification and Regression with Pretrained Protein Embeddings**
  Published in Q1 journal
  - **Overview**: Developed stacking ensemble models to predict microbial strains with high nitrogenase potential using protein language model embeddings and achieved superior performance over state-of-the-art methods. Link to article
- **Predicting RNA 5-Hydroxymethylcytosine Modification with Deep Learning Models Using RNA Language Model Embeddings**
  Under Revision
  - **Overview**: Designed a dual-branch deep learning model architecture to predict RNA 5-Hydroxymethylcytosine modifications using RNA language models and extracted biological interpretations.
- **DeepBCTPred: Deep Learning-Based Prediction of Bladder Cancer Tissues from Endoscopic Images**
  Under Review (CSE472 - Machine Learning Project)
  - **Overview**: Developed a pipeline to generate new images and a novel genetic algorithm to effectively select images from them and combined handcrafted features with learned features from convolutional neural networks.
- **Prediction of protein-carbohydrate binding sites from protein primary sequence**
  Under Rebuttal
  - **Overview**: Developed StackCBEmbed, an ensemble machine learning model for effective classification of protein-carbohydrate binding interactions at the residue level, and integrated sequence-based features with pre-trained transformer-based protein language model embeddings.
  - **Preprint**: bioRxiv

- **Predicting Protein-Carbohydrate Binding Sites: A Deep Learning Approach Integrating Protein Language Model Embeddings and Structural Features**
  Under Review (Undergraduate Thesis)
  - **Overview**: Designed a novel deep-learning architecture that integrates protein language model embeddings with structural features for predicting protein-carbohydrate binding sites.
- **Expanded Strategy Space Improves Nash Solution by Increased Degrees of Freedom**
  Manuscript in Preparation (CSE462 - Algorithm Engineering Project)
  - **Overview**: Investigated algorithmic improvements for solving the Nash Equilibrium problem and focused on approximation algorithms and meta-heuristic approaches, such as replicator dynamics, to enhance computational efficiency.
- **OptEmbed: A Multi-Task Framework Using Protein Language Model Embeddings and Sequential Features to Predict Optimal Temperature, Melting Temperature, and Optimal pH**
  Manuscript in Preparation
  - **Overview**: Introduced OptEmbed, a protein language model–based framework integrating sequential features to predict enzyme parameters (Topt, Tm, pHopt) with improved accuracy and interpretability over state-of-the-art methods.

Awards and Honors

- **BUET RISE Grant (Grant received)**
  RISE Student Research Grant [No. S2024-01-004]
- **Honorable Mentions**
  MicroProcessor and MicroController project
- **Dean's List and University Merit List**
  Recipient of both Scholarships for academic excellence.

Projects

- **OnCampus - BUET Student Hub** Github link: Backend Frontend
  CSE408 - Software Project
  - **Overview**: OnCampus is a platform for BUET students to easily manage academic and extracurricular activities. It allows users to post academic updates, conduct polls, and access notices, along with information on club events, competitions, and seminars, all in one place.
  - **Frontend**: Framework: Next.js, Styling: Tailwind CSS, Component Library: Material Tailwind, Text Box: jodit-react, PDF Viewer: react-pdf, 360° Virtual Tour: react-photo-sphere-viewer, Language: TypeScript.
  - **Backend**: Framework: Node.js, Express, Architecture: Microservice Architecture, ORM: Prisma ORM, Security: Helmet, JWT, Authentication: Keycloak, NextAuth.js.
  - **Database**: PostgreSQL hosted on Supabase, File Storage: Edgestore, Google Calendar Integration: Google Cloud API.
  - **Deployment**: MS Azure Virtual Machines, Supabase, Docker (for Keycloak), SSL Certificate from Namecheap, API Documentation with Postman.
- **MooMarket - Online Marketplace Platform** Github link: Backend & Frontend
  CSE326 - ISD Project
  - **Overview**: MooMarket is an online marketplace where sellers can advertise products like cattle and meat, with location-based display options. Buyers can filter and purchase products, place order posts, and rate sellers, while sellers can accept orders and participate in auctions. The platform also assigns priority points to sellers based on reviews and ratings.
  - **Others**: We created BPMN diagrams, mock UI, class diagrams, ERD diagrams, as well as sequence, collaboration, and state diagrams
  - **Tech Stack**: JavaScript (Node.js, Vanilla JS), Express, HTML, EJS, PostgreSQL, Git, GitHub, npm, Render.
- **AniMatrix - Content Platform** Github link: Backend & Frontend
  CSE216 - Database Project
  - **Overview**: AniMatrix is a web-based platform serving as a wiki for different content. It enables users to interact with content through voting, watchlists, reading lists, and community features like forums and chat.
  - **Tech Stack**: JavaScript (Node.js, Vanilla JS), Express, HTML, EJS, Oracle DB, Git, GitHub, npm.
- **MISP Exploration and Application** GitHub link: Codes, YouTube link: Video
  CSE406 - Security Project
  - **Overview**: We explored MISP's features and integrated it with Hive. Additionally, we utilized its REST API through the PyMISP automation library and developed a browser extension to check vulnerabilities via MISP.
  - **Technologies**: Python (Programming Language), JavaScript, MISP.
- **Pacman Game** GitHub link: Game
  CSE102 - Igraphics Project
  - **Overview**: Used the OpenGL-based iGraphics library to develop a Pacman game. The game includes the classic mechanics with some additional features.

- **Technologies**: C (Programming Language), C++, Object-Oriented Programming (OOP), iGraphics.

- **Unbeatable Protection: The 5-way Security Vault** GitHub link: Codes, YouTube link: Video
  CSE316 - MicroProcessor and MicroController Project
  - **Overview**: We have created a 5-way locker security project in a real-world implementable way. 5-way verifications were: password verification, RFID verification, face verification, voice verification, and fingerprint verification.
  - **Technologies**: Python (Programming Language), Arduino, EEE.

- **Motif Search** GitHub link: Codes
  CSE463 - Bioinformatics Project
  - **Overview**: Implemented Randomized and Gibbs Sampler Motif Search along with their modifications. Also explored web tools like MEME and MEMEChIP for motif discovery.
  - **Technologies**: Python (Programming Language).

- **Football Club Manager - Desktop App** GitHub link: Codes
  CSE108 - JavaFX Project
  - **Overview**: We developed a desktop application with a JavaFX-based UI. It utilized multithreaded socket programming for client-server communication.
  - **Technologies**: Java, JavaFX, Multithreading, Socket Programming

Certificates

- **Perfect Attendance Certificate** Issued May 2020
  Notre Dame College, Dhaka

- **Certificate in National Skill Standard Basic Course Examination, 2015** Issued Sep 2015
  Bangladesh Technical Education Board

Skills

- **Programming Languages**: Python, JavaScript, TypeScript, C, C++, Assembly (x86, MIPS), Bash, Java, LaTeX
- **Web Development**: HTML, CSS, Express, React, Svelte, Django, Next.js, Figma, Docker, Spring Boot, LangChain
- **Machine Learning**: Matplotlib, NumPy, Pandas, Scikit-learn, PyTorch
- **Tools and Technologies**: Design Patterns, Git, Microservices Architecture, Swagger API, Postman, MISP, Markdown, MS Azure Cloud VM
- **Databases**: MySQL, PostgreSQL, Oracle, Prisma ORM
- **Content Management**: WordPress
- **Game Development**: Pygame, Unity
- **Others**: Bison, Flex, Selenium, Beautiful Soup, JavaFX, ATmega32

References

- **Dr. Mohammad Saifur Rahman** Professor, Department of CSE
  Bangladesh University of Engineering and Technology (BUET) *Email: mrahman@cse.buet.ac.bd — Phone: +8801715010010*