

Abdullah Nayem Wasi Emran

Computer Science PhD (Fall 2026) Applicant
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RESEARCH INTEREST

AI/ML for Health, Causal & Fair ML, Data Mining, Health/Medical Informatics

EDUCATION

- **Bangladesh University of Engineering and Technology (BUET)** Feb 2020 - Mar 2025
BSc. (Engg.) in Computer Science and Engineering Dhaka, Bangladesh
 - **CGPA:** 3.82/4.00 [Final year: 3.98/4.00]
 - **Honors:** Dean's list award and university merit scholarship recipient in four out of eight semesters
 - **Relevant Coursework:** Machine Learning, Computer Security, Introduction to Bioinformatics, Computer Networks, Data Structures and Algorithms, Database, Linear Algebra, Software Engineering

TEACHING EXPERIENCE

- **BRAC University** June 2025 - Present
Lecturer, Department of Computer Science and Engineering Dhaka, Bangladesh
 - **Teaching:** Discrete Mathematics, Compiler Design, Computer Networks

PUBLICATIONS

- **Abdullah Nayem Wasi Emran**, Tanveer Rahman, "SCOPES: Stability-Aware Cross-Platform Feature Selection for Matched TCGA Gene Expression and RNA-Seq Data," AAAI 2026 Workshop on AI to Accelerate Science and Engineering (AI2ASE), 2026.
- **Abdullah Nayem Wasi Emran**, A. B. M. Alim Al Islam, "Mental Health Across Contexts: A Cross-Dataset Study Covering Medical Students, Quarantined Individuals, and Psychiatric-Disordered Subjects," *Humanities & Social Sciences Communications (Nature Portfolio)*, 2025. DOI: 10.1057/s41599-025-05053-x

MANUSCRIPTS UNDER REVIEW OR IN PREPARATION

- **Abdullah Nayem Wasi Emran**, Majisha Jahan Disha, Rezwana Reaz, "Fusing Exploration and Exploitation: Hybrid Fireworks–Whale Optimization for Multi-Objective Independent Task Scheduling in Cloud Environments," *under review at Cluster Computing (Springer)*, 2025. Preprint: 10.21203/rs.3.rs-6807131/v1

RESEARCH EXPERIENCE

- **Efficient RNA–Protein Interaction Prediction with Foundation-Model Embeddings** May 2025 – Present
Supervised by [Dr. Mohammad Saifur Rahman](#)
(Bioinformatics, Deep Learning)
 - Curating human RBP/non-RBP datasets (EuRBPDB, UniProt) and building a reproducible sequence-first pre-processing pipeline (SeqKit, MMseqs2); extensions to structural/network features planned.
 - Prototyping scalable models with pre-trained embeddings (ESM-2, ProtBERT) and lightweight classifiers for RBP identification, designed to run on modest compute.
- **Domain-Adaptive Causal Uplift Modeling across Heterogeneous Mental-Health Cohorts** Apr 2025 – Present
Supervised by [Dr. A. B. M. Alim Al Islam](#)
(Causal Inference, Machine Learning)

- Harmonizing heterogeneous cohort data (students, quarantined, clinical) into a comparable schema.
- Training a domain-adversarial uplift model with fairness-aware regularization and evaluating with leave-one-cohort-out AUUC.
- Studying cohort-specific calibration to handle inverted or unstable treatment effects.

• **Hybrid Fireworks–Whale Optimization for Multi-Objective Cloud Task Scheduling**

Nov 2023 – Mar 2025

Supervised by [Dr. Rezwana Reaz](#)
(Cloud Computing, Optimization)

- Designing hybrid meta-heuristics that fuse exploration (FWA) with exploitation (WOA) for cloud task scheduling.
- Benchmarking methods and analyzing trade-offs in makespan, monetary cost, and CPU/RAM/bandwidth usage.

• **Mental Health Across Contexts: A Cross-Dataset Study**

Jul 2024 – Jan 2025

Supervised by [Dr. A. B. M. Alim Al Islam](#)
(Data Mining, Network Analysis)

- Analyzing mental-health outcomes across medical students, quarantined individuals, and psychiatric-patient cohorts.
- Applying statistical modeling, network analysis, and causal methods to uncover robust cross-dataset trends.

• **Large-Language-Model-Enhanced IoT Threat Detection**

Nov 2024 – Present

Supervised by [Dr. A. B. M. Alim Al Islam](#)
(IoT Security, Explainable ML)

- Exploratory analysis and baseline modeling on NF-ToN-IoT-v2 with attention to minority-class recall and class imbalance.
- Integrating lightweight LLM-based features to improve cross-dataset robustness and interpretability.

ACADEMIC PROJECTS

• **SCOPES: Cross-Platform Gene Signature Selection**

Bioinformatics Course Project [\[repo\]](#)

- Built a leak-free, multi-objective pipeline (AUC, Kuncheva stability, MMD) to select platform-invariant gene subsets on Agilent that transfer to RNA-Seq without retraining.
- On TCGA-BRCA (505 tumor / 25 normal), achieved $AUC_{Agilent}=0.69$, $AUC_{RNA-Seq}=0.61$ ($\Delta AUC=-0.08$) with a 1-gene model; contrasted with a 30-gene model (near-perfect source AUC, poor transfer).
- **Tools & Technology:** Python (scikit-learn, pymoo), NSGA-II, MAD filter, AUC/MMD/Kuncheva

• **Lightweight Deep Learning Models for Histopathological Cancer Cell Classification**

Machine Learning Course Project [\[repo\]](#)

- Designed and implemented lightweight models using EfficientNet-B0 to classify histopathological cancer cells.
- Integrated attention mechanisms like SEBlock, MSFF, and CBAM to enhance feature recalibration and spatial learning.
- Used transfer learning (PathMNIST) and augmentations, achieving 98% accuracy on CRC-VAL-HE-7K dataset.
- **Tools & Technology:** Python (PyTorch), SEBlock, CBAM, EfficientNet-B0, Matplotlib

• **Ray-Tracing Pipeline**

Computer Graphics Sessional [\[repo\]](#)

- Developed a raster-based graphics pipeline and implemented ray tracing using C++ and OpenGL.
- Applied Phong Lighting model (ambient, diffuse, specular, recursive reflection) to render realistic shapes.
- **Tools & Technology:** C++, OpenGL

• **RecipeShare**

Software Development Project [\[repo\]](#)

- Developed a recipe-sharing web application with features for upload, editing, blog posts, and meal planning.
- Implemented recipe generation from images of ingredients using backend processing.
- **Tools & Technology:** Next.js, Django, PostgreSQL

• **Building a Subset C Compiler**

Compiler Sessional [\[repo\]](#)

- Developed a compiler from scratch in C++ using Bison and Flex.

- Implemented symbol table, lexical analyzer, semantic analyzer, and three-address code generation.
- **Tools & Technology:** C++, Bison, Flex

- **BookExchange**

Database Course Project [\[repo\]](#)

- Built a platform for users to sell, borrow, rent, or exchange books with reviews and search functionality.
- **Tools & Technology:** Next.js, Django, PostgreSQL

- **Network Simulations & TCP Adaptive Reno**

Networking Sessional [\[repo\]](#)

- Implemented socket programming in Java for inter-system communication.
- Simulated network architectures with NS-3 and explored TCP Adaptive Reno congestion control.
- **Tools & Technology:** Java, NS-3

SKILLS

- **Programming Languages:** Python, C/C++, Java, JavaScript, Bash, MySQL, HTML/CSS
- **Tools & Frameworks:** NS-3, Next.js, Django, Oracle DBMS, Git, LaTeX, Autopsy
- **Libraries:** OpenGL, Scikit-learn, Pandas, Matplotlib, Seaborn
- **Software:** Navicat, Wireshark, MS Office, Adobe Photoshop

REFERENCES

- **Dr. Rezwana Reaz** Email: rmpi@cse.buet.ac.bd
Associate Professor, Department of CSE, BUET [Thesis Supervisor]
- **Dr. A. B. M. Alim Al Islam** Email: alim_razi@cse.buet.ac.bd
Professor, Department of CSE, BUET [Research Supervisor]