Md Nafiu Rahman

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About Me

I am a curious and driven computer science student and researcher with a keen interest in software engineering and LLMs. I enjoy the art of teaching.

Education

Bangladesh University of Engineering & Technology (BUET), Dhaka *Feb 2020 – Mar 2025*
B.Sc. in Computer Science & Engineering CGPA: 3.81 / 4.00 (Final year: 3.94 / 4.00)

- Relevant coursework: Data Structures & Algorithms, Object Oriented Programming, Software Engineering, Database Systems, Numerical Methods, Machine Learning.

Notre Dame College, Dhaka *Jan 2017 – Jan 2019*
Higher Secondary Certificate GPA: 5.00 / 5.00

Bir Shrestha Noor Mohammad Public College, Dhaka *Jan 2009 – Dec 2016*
Secondary School Certificate GPA: 5.00 / 5.00

Professional Experience

Lecturer, Department of CSE, BRAC University, Dhaka July 2025 – Present

- Teaching undergraduate courses including Numerical Methods and Software Engineering. I design course materials, assignments, and practical labs with an emphasis on clear, reproducible programming and sound engineering practices.

Research Assistant, Department of CSE, BUET, Dhaka Mar 2025 – June 2025
Supervisor: Dr. Anindya Iqbal

- Worked on a pipeline to generate detailed test cases from web user interfaces using Large Language Models.

Research Experience

Secret Breach Detection in Source Code with Large Language Models.
Authors: Md Nafiu Rahman, Sadif Ahmed, Zahin Wahab, Rifat Shahriyar, S. M. Sohan.
(ESEM 2025 Technical Track)
Accepted at ESEM 2025 Technical Track
We propose a hybrid LLM-based framework for secret detection in source code, combining regex-based extraction with LLM classification to reduce false positives. Fine-tuned open-source models, including LLaMA-3.1 8B and Mistral-7B, achieve up to 0.985 F1 and 0.982 accuracy on a large GitHub benchmark.

BanglaForge: LLM Collaboration with Self-Refinement for Bangla Code Generation.
Authors: Mahir Labib Dihan, Sadif Ahmed, Md Nafiu Rahman.
(Code)
Accepted at BLP Workshop at AACL-IJCNLP 2025
We introduce BanglaForge, a framework to generate executable code from Bangla natural language descriptions using retrieval-augmented dual-model collaboration and iterative self-refinement. The system achieves 84.00% Pass@1 accuracy on the BLP-2025 benchmark.

Secret Leak Detection in Software Issue Reports using LLMs: A Comprehensive Evaluation.
Authors: Sadif Ahmed, Md Nafiu Rahman, Zahin Wahab, Rifat Shahriyar, Gias Uddin.
(arXiv)
Submitted at MSR 2026 Technical Track
We introduce a hybrid pipeline for detecting secret leaks in GitHub issue reports using regex extraction and contextual LLM classification. Fine-tuned models such as Qwen and LLaMA achieve up to 94.49% F1 and generalize well to real-world repositories (81.6% F1).

ISSUEGUARD: Real-Time Secret Leak Prevention Tool for GitHub Issue Reports.
Authors: Md Nafiu Rahman, Sadif Ahmed, Zahin Wahab, Rifat Shahriyar, Gias Uddin.
(Code)
Submitted at SANER 2026 Tool Track
We introduce IssueGuard, a real-time tool that detects sensitive information in GitHub issues before posting. Leveraging a fine-tuned CodeBERT model, LRU caching, and AMP precision, the system offers fast and accurate inference. A user study with 50 participants demonstrates its effectiveness and usability.

A Survey on Agentic Security: Applications, Threats and Defenses.
Authors: Asif Shahriar, Md Nafiu Rahman, Sadif Ahmed, Farig Sadeque, Md Rizwan Parvez.
(arXiv)
Submitted at EACL 2026
The first comprehensive survey of agentic security, reviewing 150+ papers from 2024–2025. The work organizes the field into three pillarsApplications, Threats, and Defensesproviding a unified framework to understand LLM agents in cybersecurity contexts.

Explainable Transformer-CNN Hybrid for Modeling Brain Aging from MRI Images.
Authors: Wasif Jalal, Md Nafiu Rahman, Md Sohel Rahman.
(arXiv)
In preparation for submission
Ongoing research on hybrid Transformer-CNN models for brain-age prediction, emphasizing explainability and interpretable fusion of slice-wise and volumetric MRI representations.

EVCC: Enhanced Vision Transformer-ConvNeXt-CoAtNet Fusion with Adaptive Routing for Classification.
Authors: Kazi Reyazul Hasan, Md Nafiu Rahman, Sadif Ahmed, Wasif Jalal, Shahriar Raj, Mubasshira Musarrat, Muhammad Abdullah Adnan.
(Paper)
Ongoing
EVCC is a multi-branch hybrid architecture combining Transformers and convolutional backbones through adaptive token pruning, gated cross-attention, and dynamic routing. The model improves accuracy-efficiency trade-offs with significant FLOP reductions.

Technical Skills

Data Science & ML: Python, NumPy, Pandas, Scikit-learn, PyTorch, TensorFlow, Torchvision.
Databases: PostgreSQL, PL/pgSQL, MongoDB, Firebase Firestore.
Full-Stack: Node.js (backend), HTML/CSS, React, Svelte, Flutter.
Languages: C/C++, Python, Java, JavaScript / TypeScript, PHP, Bash, Dart.

Language Profiency

Bengali Native
English IELTS Overall 8.0 – Listening: 9, Reading: 9, Writing: 7, Speaking: 6.5

Achievements

- Top 20 finalists Robi Datathon 2024 (national deep learning competition).
- Deans list award and university merit scholarship at BUET.
- 5th at BLP 2025 Code Generation Challenge

Academic Projects

- **Machine Learning Algorithms and Neural Network from Scratch** – github.com/nafiurahman00/CSE-472 – Implementations of core ML algorithms (logistic regression with ensembles, PCA/SVD for reconstruction, EM clustering) and a feed-forward neural network with Adam optimizer built from numpy.
- **Cryptography and Security Attacks** – github.com/nafiurahman00/CSE-406 – Implemented AES encryption and Diffie-Hellman key exchange, socket communication demos, and reviewed a mobile pentesting framework as part of course project.

- **Network Simulation** – github.com/nafiurahman00/CSE-322 – Implemented Congestion Control Algorithm, threaded server-client sockets, error correction algorithms and simulated wired/wireless mobility scenarios.
- **Operating System Internals with xv6** – github.com/nafiurahman00/CSE-314 – Implemented threading and synchronization primitives, system calls, and explored scheduler internals in xv6.
- **BusBuddy (Android)** – github.com/nafiurahman00/BusBuddy-Client-End – Flutter app with Node.js backend, PostgreSQL and Firebase integration. Provided ticketing, schedules, tracking and real-time updates for university bus users.
- **Nishorgo (E-commerce)** – Term-Project-2-2-Nishorgo – Full stack e-commerce site for plant sales with filtering, cart, admin analytics and order management.
- **Compiler (subset of C)** – github.com/nafiurahman00/Compiler – Subset-of-C compiler using Lex/Yacc and 8086-style assembly generation: lexer, parser, and intermediate code generation.
- **Catch the Egg (Game)** – github.com/nafiurahman00/Catch-The-Egg – OpenGL / Igraphics game for catching falling eggs; implemented game mechanics, scoring and difficulty scaling.

References

- **Dr. Rifat Shahriyar**, Professor, Department of CSE, Bangladesh University of Engineering and Technology (BUET) – rifat.shahriyar@gmail.com – rifat@cse.buet.ac.bd
- **S. M. Sohan**, Senior Engineer, Google – sohan39@gmail.com
- **Dr. Md Rizwan Parvez**, Scientist, Qatar Computing Research Institute (QCRI) – rizwan@ucla.edu – rizwan.incipient@gmail.com
- **Dr. Farig Sadeque**, Associate Professor, Department of CSE, BRAC University – farig.sadeque@bracu.ac.bd