Ratul Hasan

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EDUCATION

Bangladesh Army University of Engineering & Technology (BAUET) *Natore, Bangladesh*
B.Sc. in Computer Science and Engineering | CGPA: 3.82/4.0 *2022 – Jul 2026*

Thesis Title: Biology-Informed Recurrent Neural Networks for Longitudinal Hippocampal Atrophy Forecasting in Alzheimer's Disease

Govt. Majid Memorial City College *Khulna, Bangladesh*
Higher Secondary School Certificate | GPA: 5.0/5.0 *2019 – 2021*

IELTS Academic: Overall 7.0 (Listening 7.5, Reading 9.0, Writing 6.0, Speaking 6.0)

PUBLICATIONS

Peer-Reviewed Conference Papers

[C1] A Gas-Optimized Blockchain Framework for Scalable Document Verification Using Dynamic Access Control and IPFS *2026*
R. Hasan, S. Farjana, Y. Oley, M. O. Pranto and M. A. Rayhan. *IEEE PECCII 2026.*
doi:10.1109/PECCII70991.2026.11662071

[C2] Quantum-Resistant FOTA: End-to-End Decentralized Firmware Updates for IoT Using Blockchain and CRYSTALS-Dilithium *2025*
R. Hasan, M. M. Haque, R. Haque, Y. Oley and R. Akter. *ACM NSysS '25*, pp. 110–114.
doi:10.1145/3777555.3777569

Presented Conference Papers (Proceedings Pending)

[C3] SplitSafe Ultra: A Moving-Target Defense Framework for Entropy-Aware Encrypted File Persistence on IPFS *Presented 2026*
M. A. Muhaimin, **R. Hasan**, Y. Oley, S. Farjana, B. R. Roy, S. K. Paul and M. E. Hamid. *IEEE SPICSCON 2026.*

[C4] ActiVisionNet-Fusion: A Dual-Stream Explainable Deep Learning Framework for Driver Drowsiness Detection *Presented 2026*
N. Ahmed, **R. Hasan**, S. K. Paul, D. N. I. Noor, M. M. Haque and M. E. Hamid. *IEEE SPICSCON 2026.*

Journal Manuscripts

[J1] BI-RNN: Biology-Informed Recurrent Neural Networks for Longitudinal Hippocampal Atrophy Forecasting in Alzheimer's Disease *Under Review*
R. Hasan, M. M. Haque and A. Sarker. *Scientific Reports*, submitted May 2026. Based on B.Sc. thesis.

[J2] Entropy-Assured Post-Quantum Key Generation on IoT Edge Devices: Source Independence, Measured Min-Entropy and Signature Scheme Selection *Under Review*
R. Hasan, M. A. Rayhan and M. O. Pranto. *PLOS ONE*, submitted 2026.

[J3] Methodological Rigour and Risk Evaluation of Large Language Models in Mental Health: A Systematic Review *Submitted*
R. Hasan, M. Hoque, M. Hossain, M. K. Morol and T. H. Liew. *Frontiers in Digital Health*, submitted 2026.

Preprints

[P1] Disentangling Label-Space Shift from Domain Shift in Federated Continual Learning for Mental Health Text Classification *2026*
R. Hasan and M. Hoque. *SSRN*, 2026.
doi:10.2139/ssrn.7662638

EXPERIENCE

ELITE Research Lab LLC | *Remote* *Queens, NY, USA*
- ***Research Assistant*** *Oct 2026 – Present*
  - Contributing to a journal study that maps attacker-controllable IoT metadata as an indirect prompt-injection surface for LLM-based home agents
  - Measuring which Home Assistant device and integration text fields reach its built-in LLM conversation agents, and how often injected instructions trigger unauthorized physical actions or leak private state in a simulated home
  - Evaluating how provenance tagging, actuating-tool gating and action confirmation reduce attack success, and their cost in benign-task utility

- ***Research Intern*** *Jun 2026 – Sep 2026*
  - First-authored a systematic review of 82 studies on LLMs in mental health, appraising methodological rigour and risk reporting (hallucination, bias, safety, human evaluation) with a 24-field extraction instrument
  - Studied catastrophic forgetting in federated continual learning for mental health text classification, separating label-space shift from domain shift on Reddit stress and depression data
  - Benchmarked seven training regimes, including FedAvg, FedProx, EWC, replay and centralized baselines, across 10 clients and three seeds with a MiniLM encoder

BAUET Computer Society, Dept. of CSE | ***Programming Instructor*** *Natore, Bangladesh*
Jul 2024 – Dec 2025

- Conducted programming classes for undergraduate students covering C, C++ and basic data structures
- Led coding exercises and programming contest preparation sessions to strengthen students' problem-solving and analytical skills
- Explained programming concepts to students of varying skill levels and supported the development of their programming fundamentals

Lab AR | ***Software Engineering Intern*** *Dhaka, Bangladesh*
Jul 2025 – Aug 2025

- Led a team project to develop a web-based Property Management System
- Contributed to backend development using Laravel (PHP) and collaborated on feature implementation

PROJECTS

LedgerSeal: A Blockchain-Based Document Verification Framework using Dynamic Access Control and IPFS *GitHub*

- Developed a decentralized application (DApp) for constant-time document verification with dynamic access control on IPFS using an EVM-compatible blockchain. *Tools: React, Anvil EVM, Foundry, MetaMask, Pinata IPFS*

BAUET Project & Thesis Archive *GitHub*

- Developed a repository website using Django (both MVT & REST) that archives and indexes BAUET theses and student projects. *Tools: HTML, Tailwind CSS, JavaScript, Django, PostgreSQL*

HONORS & COMPETITIVE PROGRAMMING

Online Judges

- Codeforces: Expert, max 1650 (**Ratul_Hasan**) | CodeChef: 3 Star, max 1676 (**ratulhasan2108**)

Programming Contests

- ICPC Asia Dhaka Regional Contestant (Team: BAUET_Rong_Answer)
- National Collegiate Programming Contest (JU): Rank 149 (Team: BAUET_PARADIGM)
- Inter-University Programming Contest (twice): Best Rank 45 at IUT (Team: BAUET_Twisted_Minds)
- Ranked 10th in Independence Day Programming Contest by Military Institute of Science & Technology
- Intra-University Programming Contest: Champion and 2nd Runner-up (Team), Runner-up (Solo)

Others

- 1st Runner-up, Intra-University Three Minute Thesis (3MT) Presentation

TECHNICAL SKILLS

Languages: Python, C, C++, JavaScript, SQL, Solidity
ML & Research: PyTorch, Hugging Face (Transformers)
Web & Blockchain: Django, Django REST Framework, Laravel, React, Foundry, IPFS
DevOps & Databases: Git, GitHub, GitHub Actions, Docker, Trivy, Linux, PostgreSQL, MySQL
Research Interests: Deep Learning, NLP & Large Language Models, LLM Safety & Security, MLOps & DevOps for ML Systems, Cloud Infrastructure & CI/CD Automation

VOLUNTEERING & LEADERSHIP EXPERIENCE

- President, BAUET Computer Society (promoted through five executive roles)
- Problem Setter, Intra-University Programming Contest, BAUET
- Officer of Documentation, Hult Prize at BAUET