

# HABIBOR RAHMAN RABBY

Machine Learning & NLP Researcher

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20

PUBLISHED PAPERS

1

ACCEPTED PAPERS

57+

CITATIONS

4

TPC ROLES

18

PEER REVIEWS

3

UNDER REVIEW PAPERS

## RESEARCH PROFILE

Machine Learning and Natural Language Processing researcher with a focus on **predictive modeling**, **time-series analysis**, and **AI-driven decision systems**. My work applies data-driven approaches to real-world problems in **healthcare**, **cybersecurity**, and **public systems**, with an emphasis on scalability, interpretability, and practical deployment. Author of multiple peer-reviewed publications in **IEEE conferences and international journals**, with ongoing research in **deep learning**, **federated learning**, and **clinical decision support systems**. Actively engaged in academic service through **peer review and technical program committee roles**.

## RESEARCH INTERESTS

**Core:** Machine Learning & Natural Language Processing

**Methods:** Graph Neural Networks, Federated Learning, Privacy-Preserving ML, Self-Supervised Learning, Deep Learning, Sentiment Analysis, Time-Series Forecasting

**Domains:** Healthcare AI, Cybersecurity, Critical Infrastructure Protection, Public-Sector Systems

## RESEARCH LAB AFFILIATION

Mar 2023 – Present

### Research Assistant

*Advanced Machine Intelligence Research Lab (AMIRL)* 

- **Principal Investigator:** Prof. Dr. Mohammad Firoz Mridha
- **Focus Areas:** Privacy-preserving, federated, and graph-based deep learning for healthcare IoT, clinical decision support, and cyber-resilient critical infrastructure
- Co-authored **10 research papers** under this lab – **5 published**, **2 accepted**, and **3 under review** across Q1 (SCI-indexed) journals and IEEE conferences
- Led research spanning **Graph Neural Networks**, **multimodal federated learning pipelines**, and **multi-agent reinforcement learning** for safety-critical AI systems
- Designed end-to-end ML pipelines and collaborated with the PI on problem framing, experimental design, ablation studies, and manuscript preparation

## PEER-REVIEWED PUBLICATIONS

### JOURNAL PAPERS – PUBLISHED

- 01 M. I. M. Tanvir, N. Y. Nadia, **H. R. Rabby**, et al. “**Spatial-Temporal Graph Neural Network with Autoencoder Pretraining for Intrusion Detection in Healthcare IoT Ecosystems.**” *Scientific Reports (Nature Portfolio)*, 2026.  
DOI: 10.1038/s41598-026-45041-y

### GRANT FUNDED · INTERNATIONAL RESEARCH AWARD

Open access funded by **Kristiania University College**. Partially supported by the **UTFORSK Programme**, Norwegian Directorate for Higher Education and Skills (HK-dir), under "Sustainable AI Literacy in Higher Education through Multilateral Collaborations (SAIL-MC)" – Project No. UTF-2024/10225.

- 02 M. I. M. Tanvir, **H. R. Rabby**, et al. “**Privacy-Preserving Multimodal Federated Learning Pipeline for Cyber-Resilient Healthcare Systems.**” *PLOS ONE*, 2026.  
DOI: 10.1371/journal.pone.0343669

#### FEATURED PUBLICATION

Spotlighted on **GrowKudos** — a public research engagement platform used by 800,000+ researchers worldwide to amplify research visibility and communicate findings to broader, non-specialist audiences.

- 03 N. Y. Nadia, M. H. Arif, **H. R. Rabby**, et al. “**Hybrid Deep Learning Approach for Coupled Demand Forecasting and Supply Chain Optimization.**” *Computers, Materials & Continua (CMC)*, Tech Science Press, 2026.  
DOI: 10.32604/cmc.2026.074236
- 04 M. H. Arif, **H. R. Rabby**, et al. “**AI-Driven Risk Assessment in National Security Projects: Investigating Machine Learning Models to Predict and Mitigate Risks in Defense and Critical Infrastructure Projects.**” *Journal of Computer Science and Technology Studies*, Vol. 7, No. 2, pp. 71–85, 2025.  
DOI: 10.32996/jcsts.2025.7.2.6
- 05 **H. R. Rabby**, et al. “**Digital Divide in the Homeless Population: Machine Learning Analysis of Technology Access and Usage Patterns in California, USA.**” *Journal of Information Systems Engineering and Management*, Vol. 10, No. 63s, pp. 1523–1539, 2025.  
DOI: 10.52783/jisem.v10i63s.14171
- 06 Mahmuda, **H. R. Rabby**, et al. “**Machine Learning-Driven AI Insights: Transforming Strategic Decision-Making for U.S. Businesses.**” *Cuestiones de Fisioterapia*, Vol. 54, No. 5, 2025.  
DOI: 10.48047/s3wy1048
- 07 M. H. Arif, **H. R. Rabby**, et al. “**Machine Learning Models for Cybersecurity Risk Analysis in U.S. Critical Infrastructure Systems.**” *Journal of Information Systems Engineering and Management*, Vol. 11, No. 1s, 2026.  
DOI: 10.52783/jisem.v11i1s.14284
- 08 N. Y. Nadia, M. H. Arif, **H. R. Rabby**, et al. “**Security Analytics Using Machine Learning Methods for Federal Government Cloud Systems.**” *Journal of Information Systems Engineering and Management*, Vol. 11, No. 1s, 2026.  
DOI: 10.52783/jisem.v11i1s.14285
- 09 N. Y. Nadia, **H. R. Rabby**, M. H. Arif, A. R. Lindon, and H. A. Khan. “**BioFilter-MoE: Multi-Task Mixture-of-Experts Transformer for Textile Wastewater Prediction and Treatment Recommendation.**” *Well Testing Journal*, 32(2), 238–266, 2023.  
DOI: 10.66669/WT.v35iS2.292
- 10 A. R. Lindon, H. A. Khan, N. Y. Nadia, **H. R. Rabby**, and M. H. Arif. “**AI Driven Clinical Decision Support Systems: A Retrieval Augmented Generation Approach for Healthcare Delivery and Efficiency.**” *Cuestiones de Fisioterapia*, 2024.  
DOI: 10.48047/v90mq567
- 11 M. H. Arif, A. R. Lindon, H. A. Khan, N. Y. Nadia, M. Z. Ferdus, and **H. R. Rabby**. “**Optimizing Hospital Logistics and Healthcare Supply Chains Using Machine Learning and Artificial Intelligence Techniques.**” *Journal of Electrical Systems*, 2024.  
DOI: 10.52783/jes.9589
- 12 H. A. Khan, N. Y. Nadia, **H. R. Rabby**, A. R. Lindon, Z. Ferdus, and H. Arif. “**DATA-DRIVEN EPIDEMIOLOGICAL MODELING USING MACHINE LEARNING FOR DISEASE SPREAD FORECASTING AND PUBLIC HEALTH DECISION SUPPORT IN THE UNITED STATES**” *International Journal of Applied Mathematics (IJAM)*, Vol. 37, No. 6S, 2024.  
DOI: 10.12732/ijam.v37i6s.2029
- 13 **H. R. Rabby**, H. Arif, A. R. Lindon, H. A. Khan, and N. Y. Nadia. “**Intelligent Mathematical Modeling of Healthcare Systems Using Machine Learning for Cost Efficiency and Patient Outcome Improvement.**” *Journal of Electrical Systems*, 2024.  
DOI: 10.52783/jes.9625

#### IEEE CONFERENCE PAPERS — PUBLISHED

- 14 **H. R. Rabby**, M. Hasan, I. Jahan, et al. “**Coronavirus Disease Outbreak Prediction and Analysis Using Machine Learning and Classical Time Series Forecasting Models.**” *Intl. Conference on AI and Quantum Computation-Based Sensor Application (ICAIQSA)*, 2024, IEEE.  
DOI: 10.1109/ICAIQSA64000.2024.10882176

- 15 **H. R. Rabby**, I. Jahan, M. Hasan, et al. “**Comparative Analysis of Machine Learning Algorithms for Breast Cancer Prediction Using Fine Needle Aspirate Image Features.**” *Intl. Conference on Emerging Trends in Industry 4.0 Technologies (ICETI4T)*, 2025, *IEEE*.  
DOI: 10.1109/ICETI4T63625.2025.11132221
- 16 N. Y. Nadia, **H. R. Rabby**, et al. “**Scalable RNN-Based Transfer Learning for Patient Sentiment Monitoring in Telehealth Platforms.**” *2nd Intl. Conference on Computing, Applications and Systems (COMPAS)*, 2025, *IEEE*.  
DOI: 10.1109/COMPAS67506.2025.11381638
- 17 M. I. M. Tanvir, N. Y. Nadia, **H. R. Rabby**, et al. “**Self-Supervised and Domain-Adaptive Deep Learning for Early Detection of Cyber-Attacks in Healthcare IoT Systems.**” *Intl. Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT)*, 2025, *IEEE*.  
DOI: 10.1109/3ict68299.2025.11442237
- 18 **H. R. Rabby**, et al. “**Multi-Task Hybrid Deep Learning with Cross-Domain Alignment for Real-Time Sentiment Analysis in Clinical Decision Support Systems.**” *Intl. Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT)*, 2025, *IEEE*.  
DOI: 10.1109/3ict68299.2025.11442074
- 19 M. H. Arif, M. I. M. Tanvir, N. Y. Nadia, **H. R. Rabby**, et al. “**Two-Stream Adaptive Neural Network for Personalized Mental Health Trend Forecasting.**” *28th Intl. Conference on Computer and Information Technology (ICCIT)*, 2025, *IEEE*.  
DOI: 10.1109/ICCIT68739.2025.11490256
- 20 M. J. Hossain, M. H. H. Hridoy, **H. R. Rabby**, et al. “**Evaluating Classical and Transformer Architectures for Fine-Grained Bangla Review Analytics.**” *IEEE 2nd International Conference on Quantum Photonics, Artificial Intelligence & Networking (QPAIN)*, 2026, *IEEE*.  
DOI: 10.1109/QPAIN69676.2026.11546671

#### ACCEPTED PAPERS — IN PRESS

- 21 T. Mahmud, M. H. Arif, M. Faisal, **H. R. Rabby**, N. Y. Nadia. “**Explainable Stacking Ensemble for Accurate Asthma Prediction Using Clinical and Environmental Data.**” *PECCII 2026*, *\*\*accepted\*\**.


#### ■ GRANTS & RESEARCH FUNDING

- Dec 2025 – Apr 2026      **Sustainable AI Literacy in Higher Education through Multilateral Collaborations (SAIL-MC)**  
*International Research Grant, UTFORSK Programme*
- **Funder:** Norwegian Directorate for Higher Education and Skills (HK-dir), Oslo, Norway
  - **Project No.:** UTF-2024/10225 · **Host:** Kristiania University College
  - Supported AI cybersecurity research published in *Scientific Reports* (Nature Portfolio, 2026)

#### ■ PATENTS & INTELLECTUAL PROPERTY

- Apr 2026      **Deep Learning Integrated Government Cyber Shield Gateway Unit**  
*UK Design Patent — Filed · Machine Learning*
- **Inventors:** Habibor Rahman Rabby, Md Habibul Arif, Nusrat Yasmin Nadia
- 2026      **Machine Learning-Based Predictive Maintenance System for Industrial Equipment**  
*Canadian Utility Patent — Pre-Filing · Machine Learning*

#### ■ MEDIA COVERAGE & RESEARCH VISIBILITY

- 2026      **GrowKudos Research Spotlight**  
*"Privacy-Preserving Multimodal Federated Learning Pipeline for Cyber-Resilient Healthcare Systems" *
- Featured on **GrowKudos** — a public research engagement platform serving 800,000+ researchers across 160+ countries
  - Selected to amplify federated learning research for broader, non-specialist audiences

## ■ ACADEMIC SERVICE & EDITORIAL ROLES

- 2025 – Present **Editorial Board Member**  
*Frontiers in Computer Science and Artificial Intelligence (FCSAI)* 
- Apr 2026 – Present **Technical Program Committee (TPC) Reviewer**  
*ICETCI 2026 – 2026 IEEE 6th Intl. Conference on Emerging Techniques in Computational Intelligence*
- Reviewed 6 manuscripts spanning Computational Intelligence, Deep Learning, AI/ML, NLP, Cybersecurity, Healthcare AI, Sentiment Analysis, and related tracks
- Mar 2026 – Present **Technical Program Committee (TPC) Reviewer**  
*MobiApps 2026 – 12th Intl. Workshop on Mobile Applications*
- Reviewing manuscripts in mobile applications, machine learning, IoT, and security
- Jan 2026 – Present **Technical Program Committee (TPC) Reviewer**  
*FET'26 – IEEE Frontiers of Engineering & Emerging Technologies*
- Reviewed 4 manuscripts in AI/ML tracks
- Apr 2026 **Peer Reviewer**  
*EAI Endorsed Transactions on Internet of Things \*(European Alliance for Innovation)\**
- Reviewed: "Flood Prediction employing U-Net – A Case Study of Teesta Dam"
- Jan 2026 **Peer Reviewer**  
*Frontiers in Computer Science and Artificial Intelligence (FCSAI)*
- Reviewed: "Deep Learning for Intelligent Supply Chain Optimization: Enhancing Operational Efficiency and Waste Reduction in U.S. Service Industries"
- Sep – Nov 2025 **Technical Program Committee (TPC) Reviewer**  
*3ICT 2025 – IEEE Intl. Conference on Innovation, Intelligence for Informatics, Computing, and Technologies* 
- Reviewed 6 manuscripts in artificial intelligence, machine learning, and data analytics

## ■ EDUCATION

- Oct 2022 – Aug 2024 **Master of Science in Computer Science**  
*Campbellsville University, Campbellsville, KY, USA*
- GPA: 3.90/4.00
  - Coursework: Machine Learning, Deep Learning, Data Mining, Statistical Analysis
- Jan 2017 – Mar 2021 **Bachelor of Science in Computer Science & Engineering**  
*Port City International University, Chattogram, Bangladesh*
- GPA: 3.77/4.00
  - Honors: PCIU Hackathon Winner, Dept. of CSE (Nov 2018)
  - Volunteer: campus academic and community events (Sept 2017 – Jan 2019)

## ■ PROFESSIONAL EXPERIENCE

- May 2025 – Present **Full Stack Developer**  
*Upskill Consultancy, New York, NY, USA*
- Design, develop, and maintain full-stack web applications integrating front-end interfaces with scalable server-side architecture
  - Collaborate with cross-functional teams in agile environments to deliver high-quality software solutions
- Sep 2024 – May 2025 **Software Developer**  
*ThothIT LLC, Texas, USA*
- Analyzed, designed, and developed programs based on user requirements; oversaw unit testing for functionality and usability

Apr 2021 – Aug 2022

## Software Engineer

*KITRIM Soft Limited, Chattogram, Bangladesh*

- Delivered software in collaboration with product managers, designers, and QA engineers
- Conducted unit and integration testing; refined code based on performance analysis

### ■ TECHNICAL SKILLS

**Programming** Python, C, C++, Java

**ML & AI** PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy

**Databases** MySQL, SQL Server (SSMS), SQL Query

**Web & Tools** HTML, CSS, PHP, JavaScript, Bootstrap, XML, Jupyter Notebook, Git

### ■ PROFESSIONAL MEMBERSHIPS

- **IEEE** – Institute of Electrical and Electronics Engineers (*Member ID: 97085927*)
- **ACM** – Association for Computing Machinery (*Member ID: 4576516*)
- **IEEE Young Professionals** – Certificate of Membership
- **AAAS** – American Association for the Advancement of Science (*Member ID: 61121403*)
- **FMERC** – Fellow Member, Eudoxia Research Centre, India (*ERC/FMERC/2026/909; 2026 – Present*)
- **FMERU** – Fellow Member, Eudoxia Research University, USA (*ERU/FMERU/2026-909; Feb 2026 – Present*)

### ■ CERTIFICATIONS & PRESENTATIONS

- **Research Paper Presenter** – IEEE ICETI4T 2025, Intl. Conference on Emerging Trends in Industry 4.0 Technologies, IEEE Bombay Section, Navi Mumbai, India (Jun 2025)
- **Android & Mobile Application Development** – ICT Division, Government of Bangladesh; 200-hour certified training program (May – Nov 2018)
- **Game Development Workshop** – AGAMiLabs Limited, Port City International University, Chattogram (Jul 2018)

### ■ LANGUAGES

**English** Fluent • **Bangla** Native • **Hindi** Conversational

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