

Rawhatur Rabbi

RESEARCH ASSISTANT · AI ENGINEER

Dhaka 1216, Bangladesh

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Work Experience

Research Assistant

Dhaka, Bangladesh

Brac University

Sep 2023 - Present

- Conducted research and authored scholarly articles for high-impact journals and international conferences, while mentoring and providing guidance to undergraduate students throughout their research projects.
- Developed, and optimized deep learning models and neural network architectures for real-time image and video analysis, addressing critical research challenges. This involved applying advanced computer vision techniques and transfer learning strategies to enhance model accuracy and efficiency, particularly in image classification tasks using domain-specific datasets.
- Designed and optimized the database structure for researchers and student records, enhancing data accessibility and reliability.
- Executed in-depth research and conducted rigorous data analysis using a diverse array of tools and techniques.
- Contributed to securing research funding by drafting compelling sections of grant proposals for projects focused on Machine learning and computer vision
- Technical Skills:** Python, TensorFlow, Keras, OpenCV, CUDA, PyTorch, Mediapipe, YOLO.

Software Engineer Trainee (AI & ML)

Dhaka, Bangladesh

Medina Tech Ltd.

Apr 2023 - Sept 2023

- Enhanced datasets through data augmentation, diversifying data by 30%, and performed in-depth data analysis, leading to a 20% improvement in model performance.
- Implemented geocode visualization methods, identifying location-based trends, and generated reports.
- Optimized machine learning models with Bayesian optimization, resulting in a remarkable 60% accuracy improvement under specific conditions compared to older models with 10-15% accuracy.
- Collaborated on backend development using Django and Odoo, contributing to the seamless functionality of web applications and databases.
- Effectively maintained AWS servers for stability and managed local Linux servers, ensuring system updates and security.
- Technical Skills:** Python, Keras, Tensorflow, NumPy, Pandas, Scikit-learn, Linux, Nginx, PostgreSQL, Django, Odoo, Git.

Student Tutor/Undergraduate Teaching Assistant

Dhaka, Bangladesh

Brac University

Jan 2022 - Apr 2022

- Provided personalized one-on-one instruction to address individual learning needs.
- Simplified complex math and computer science concepts for better comprehension.
- Tracked student progress and tailored tutoring sessions accordingly.
- Provided coding guidance, helping with algorithm design and debugging.
- Created and shared study materials, including practice problems and solutions.

QA & Automation Tester

Oslo, Norway

Master Wizr

Jul 2021 - Jan 2024

- Developed and executed comprehensive test plans and cases for software applications to ensure alignment with system specifications.
- Automated repetitive testing tasks using tools like Selenium and Postman, reducing manual testing time by 50%.
- Identified, documented, and reported bugs, tracking them through to resolution to maintain software quality standards.
- Soft Skills:** Selenium, Pytest, Jira.

Web Developer Intern

Dhaka, Bangladesh

ParallaxLogic Infotech

Nov 2020 - Feb 2021

- Developed responsive UI components using React.js for improved cross-device compatibility.
- Implemented RESTful APIs with Node.js to enhance data management and communication.
- Collaborated on full-stack projects, gaining experience in both frontend and backend development.
- Managed code updates and teamwork using Git for version control.
- Technical Skills:** Javascript, nodesjs, Reactjs, Html, Git

Education

BRAC University

Dhaka, Bangladesh

MSc in Computer Science and Engineering

Apr 2024 - Present

- Current CGPA: 3.83/4.00.
- Working as a Graduate Research Assistant
- Courses:** Symbolic Machine Learning, Advanced Artificial Intelligence, Information Assurance and Human Factor, Pattern Recognition, Advanced NLP.

BRAC University

BSc in Computer Science and Engineering

- Graduated with high distinction, achieving a CGPA of 3.62/4.00
- Worked as a student Tutor
- **Courses:** Data Structure, Algorithm, Programming for the Internet, Software Engineering, Artificial Intelligence, Machine Learning, Database Design

Dhaka, Bangladesh

Jan 2019 - Dec 2022

Notre Dame College

Higher Secondary School Certificate

- GPA: 5.00/5.00

Dhaka, Bangladesh

Mar 2016 - Aug 2018

Monipur High School

Secondary School Certificate

- GPA: 5.00/5.00

Dhaka, Bangladesh

Jan 2005 - Feb 2016

Publications

C=Conference, J=Journal, S=In Submission, T=Thesis, O=On Going

- [J.1] Datta, J., **Rabbi, R.**, Saha, P. et al. **Deep Representation Learning using Layer-wise VICReg Losses**. *Nature Scientific Reports*. 15, 27049 (2025). <https://doi.org/10.1038/s41598-025-08504-2>
- [C.1] Arefin, M. Y., **Rabbi, R.**, Turna, I. F., Zannat, Z., & Karim, D. Z. (2023). **Lightweight Custom CNNs Take on Corn Leaf Disease: Deep Learning for Plant Pathology**. In *Proceedings of the 2023 3rd International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)*, IEEE. 19-21 July 2023, Tenerife, Canary Islands, Spain. DOI: <https://doi.org/10.1109/ICECCME57830.2023.10252315>
- [C.2] **Rabbi, R.**, Datta, J., Ahmed, S., & Zereen, A. N., (2024). **Wildfire Prediction using Convolutional Kolmogorov-Arnold Network**. In *2024 13th International Conference on Electrical and Computer Engineering (ICECE)* (pp. 667-672). IEEE.
- [C.3] Datta, J., Sarwar, F. A., **Rabbi, R.**, Saha, P., Alam, M. G. R., Uddin, J., & Zereen, A. N., (2025). **Parameter-Efficient Image Classification with Convolutional Spiking Neural Network via Fast Sigmoid Surrogate Gradient Descent**. *2025 International Conference on Electrical, Computer and Communication Engineering (ECCE)*, Chittagong, Bangladesh, pp. 1-6, doi: 10.1109/ECCE64574.2025.11013059..
- [C.4] J. Datta, **R. Rabbi**, N. I. Rafin and M. G. R. Alam, “**Peer-Guided Optimization: Incorporating Collaborative Learning into Stochastic Optimization in Machine Learning**,” *2025 International Conference on Electrical, Computer and Communication Engineering (ECCE)*, Chittagong, Bangladesh, 2025, pp. 1-6, doi: 10.1109/ECCE64574.2025.11013057.
- [S.1] **Rabbi, R.**, Hasan, M., Zereen, A. N., & Alam, M. G. R. (2024). **Compact Convolutional Transformers with Squeeze-and-Excitation: An Advanced Deepfake Detection Model Using Custom StyleGAN2 Dataset**. Manuscript submitted for publication in *Heliyon*.
- [O.1] **Rabbi, R.**, et al. (2024). **Minimizing the Effect of Sleep Deprivation in the Forward-Forward Algorithm**. Submitted to AAAI 2026.
- [T.1] **Rabbi, R.**, Arefin, M. Y., Turna, I. F., & Zannat, Z. (2023). **Corn Leaf Disease Detection using Deep Convolutional Neural Network**. Undergraduate thesis, Department of Computer Science and Engineering, Brac University. Available at: <https://dspace.bracu.ac.bd/xmlui/handle/10361/20155>.

Skills

Front End	HTML5, CSS3, Bootstrap, Material UI, JavaScript, ReactJs.
Back End	Nodejs, Express.js, Django.
Database	MongoDB, MySQL, Postgresql, Firebase.
ML	TensorFlow, Keras, PyTorch, Langchain, ChromaDB.
Mobile App	Flutter, Java.
Deployment	Linux, Shell (Bash/Zsh), Aws(EC2, RDS, S3), Docker.

Achievements

2024	Secured Fund of 0.8M BDT , Research Seed Grant Initiative 2024	Brac University
2022	Finalist , RUET CSE FEST	RUET
2021	Finalist , Hackathon of Joyjatra'21 National Fest	Bangladesh
2020	2nd Runner-up , Intra-University Programming Contest	Brac University
2019	Vice Chancellor's (VC) list , Listed for outstanding academic performance.	Brac University
2018	Life Time Membership , Notre Dame Science Club	NDC
2014	2nd Position, Web Designing Competition , Notre Dame Annual Science Festival 2014 & 24th GKC	NDC

Projects

Video Analytics for Real-Time Fall Detection and Activity Recognition to Assist Elderly People

Dhaka, Bangladesh

Research Seed Grant Initiative 2024, BRAC University

Oct 2024 – Present

- Led the development of a real-time fall detection system using advanced video analytics, improving the safety and well-being of elderly individuals living independently.
- Developed a custom dataset of falls and daily activities, using pose estimation and machine learning to enhance detection accuracy.
- Integrated edge-based processing with NVIDIA Jetson Orin Nano for real-time fall detection, providing immediate cloud-based alerts to caregivers.

AgriBuddy: AI-Powered Agricultural Guidance System for Bangladeshi Farmers

Dhaka, Bangladesh

AgriBRACUtion – BRAC AI Hackathon

Jan 2024 – Present

- Developed AgriBuddy, a multilingual AI-powered support system offering personalized agricultural guidance to smallholder farmers in Bangladesh.
- Implemented CNN-based rice disease detection trained on the Paddy Doctor dataset, enabling real-time identification of 10 rice conditions.
- Integrated a Agentic Retrieval-Augmented Generation (RAG) framework using Bangla embeddings for context-aware responses through a smart chatbot.
- Designed a Progressive Web App (PWA) with offline support, combining weather analysis, soil assessment, and personalized cultivation tips.
- Collaborated with a multidisciplinary team across BRAC University, BUET, and DIU; published a technical report and delivered a public presentation.

Real Time Plant Diseases Detection Apps

Dhaka, Bangladesh

Dr. Chashi by Medina Tech Ltd.

Apr 2023 – Sept 2023

- Played a pivotal role in fine-tuning the Dr. Chashi digital farming model, enhancing its accuracy and predictive capabilities to provide farmers with precise and timely agricultural insights.
- Collaborated with agricultural experts and researchers to incorporate the latest findings and innovations into the Dr. Chashi platform, keeping it at the forefront of digital farming technology.

Extra Curricular Activities

Instructor

Brac University

Basic of Robotics Workshop

Jan 2022 – Dec 2022

- Instructed students in Arduino programming, covering coding principles and syntax.
- Demonstrated the practical applications of various sensors, including ultrasonic, infrared, and temperature sensors.
- Guided students in the construction of line follower robots, soccer bots, and obstacle-avoidance robots.
- Designed custom circuits for real-life projects, optimizing functionality and efficiency.
- **Technical Skills:** C/C++, Circuit, Arduino, Interfacing.

Director

Dhaka, Bangladesh

Robotics Club of Brac University.

Apr 2023 – Sept 2023

- Led a redesign of ROBU's portfolio website, incorporating modern features, improved navigation, and cross-functional collaboration.
- Organized and managed a variety of successful events, including workshops, seminars, and robotics competitions.
- Prepared and presented comprehensive financial reports, analyzing budgets and recommending cost-saving measures.

References

1. Dr. Aniqua Nusrat Zereen

Assistant Professor, Department of Computer Science and Engineering

School of Data and Sciences, Brac University

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Phone: +88017 1115 8849

Relationship: Supervisor (Current Full-time Research Assistant Role)

2. Dr. Md. Golam Rabiul Alam, PhD

Professor, Department of Computer Science and Engineering

School of Data and Sciences, Brac University

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Phone: +88017 97347635

Relationship: Project Supervisor

3. Dr. Jia Uddin

Professor, AI and Big Data Department Endicott College

Woosong University, Daejeon, South Korea

Email: jia.uddin@wsu.ac.kr

Phone: +82-1062720727

Relationship: Project Supervisor