

## Faruk Ahmed

Lecturer, Department of Software Engineering  
Daffodil International University, Dhaka, Bangladesh  
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### EDUCATION

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**Daffodil International University**, Dhaka, Bangladesh May 2021 – April 2025  
Bachelor of Science in Computer Science and Engineering CGPA: 3.96/4.00  
Thesis: An Explainable Artificial Intelligence-Driven Minimal Net for Tea Leaf Disease Detection  
**Achieved 1st Position in the Batch**

### RESEARCH STATEMENT

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I am an AI researcher specializing in computer vision, explainable AI (XAI), and resource-efficient deep learning systems. My research focuses on designing lightweight neural architectures for real-world deployment in resource-constrained environments, medical image analysis, and trustworthy AI. I have demonstrated the ability to produce independent, high-quality research, publishing in Q1 journals (Scientific Reports, IEEE Access) and contributing 10 open-access datasets to the research community before completing my undergraduate degree. I am applying to the KFUPM Direct PhD program in Computer Science with a focus on the **Algorithms** concentration, where I aim to advance research in efficient deep learning algorithms, model interpretability, and applied AI for healthcare and agriculture.

### RESEARCH INTERESTS

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Deep Learning • Computer Vision • Explainable AI (XAI) • Lightweight Neural Architecture Design • Medical Image Analysis  
• Edge AI & TinyML • Machine Learning Algorithms • Biomedical Engineering Applications

### RESEARCH EXPERIENCE

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**Undergraduate Researcher, 4IR Research Cell** Dhaka, Bangladesh  
Daffodil International University January 2024 – January 2025

- Conducted research on deep learning and computer vision systems for real-world applications, focusing on image analysis, feature representation learning, and model optimization.
- Supervised and mentored 50+ undergraduate researchers in AI-focused projects and academic writing.
- Led dataset curation, model training, evaluation, and deployment of multiple machine learning projects resulting in peer-reviewed publications and open-access dataset releases.

### TEACHING EXPERIENCE

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**Lecturer, Department of Software Engineering** Dhaka, Bangladesh  
Daffodil International University September 2025 – Present

- Teach core undergraduate courses: Introduction to Machine Learning (Theory & Lab), Artificial Intelligence Lab, Statistical Data Analysis (Theory & Lab), Research Methodology, and Data Structures.
- Develop course materials, labs, and assessments; supervise student research projects in AI and computing.
- Currently collaborating with department head on a research project in student mental health analysis using AI.

### RESEARCH PROJECTS

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**Explainable Minimal CNN for Tea Leaf Disease Detection** 2024–2025  
*Lead Researcher* (BSc Thesis)

- Designed a custom ultra-lightweight CNN with only **49K trainable parameters (190KB)** — a novel architectural contribution targeting edge deployment on resource-constrained devices.
- Achieved **98% classification accuracy**; deployed as an Android mobile application enabling real-time, offline inference directly in agricultural field settings.
- Integrated Grad-CAM-based Explainable AI (XAI) techniques to provide interpretable, human-understandable model decisions for non-expert users.

**AI-Enabled IoT Smart Irrigation System** 2025  
*AI Lead & System Architect*

- Designed and implemented an end-to-end AI-integrated IoT framework for adaptive, sensor-driven irrigation scheduling using predictive ML models.
- Achieved a **38% reduction in water consumption** under field-tested conditions, demonstrating measurable real-world impact.
- Awarded **Award of Distinction** at the 5th International Data Science Olympiad (IDSOL 2025), Hong Kong.

## LBNet: Lightweight CNN for Breast Cancer Classification with XAI

2025–2026

Co-Researcher

- Co-developed an optimized lightweight CNN for mammographic breast cancer classification integrating XAI-based interpretability for clinical decision support.
- Published in *Scientific Reports* (Nature Portfolio, Q1).

## PUBLICATIONS

### Journal Publications

- Ahmmed, J., **Faruk Ahmed**, Kabir, M. A., Ahad, M. T., Jadoon, M. A., Rehman, A. U., & Bermak, A. (2026). LBNet: an optimized lightweight CNN for mammographic breast cancer classification with XAI-based interpretability. *Scientific Reports*, 16. [Q1, Nature Portfolio]
- Ahmmed, J., **Faruk Ahmed**, Rehman, A. U., Ali, N., Kabir, M. A., & Bermak, A. (2026). HPrEd: A Tuned Ensemble with Model-Agnostic XAI to Explain Social Media’s Association with Academic Productivity. *IEEE Access*. [Q1, IEEE]
- Ahad, M. T., **Faruk Ahmed**, Bhowmik, A. C., Mim, Z. M., Anu, A. D., & Busch, P. (2025). Exploring micro-credential affordances in Bangladeshi higher education. *Education and Information Technologies*, 1–33. [Q1, Springer]
- Islam, R., Ahad, M. T., **Faruk Ahmed**, Song, B., & Li, Y. (2024). Mental Health Diagnosis From Voice Data Using Convolutional Neural Networks and Vision Transformers. *Journal of Voice*. [Elsevier]
- Bhowmik, A. C., Ahad, M. T., Emon, Y. R., **Faruk Ahmed**, Song, B., & Li, Y. (2024). A customised Vision Transformer for accurate detection and classification of Java Plum leaf disease. *Smart Agricultural Technology*, 8, 100500. [Elsevier]

### Conference Publications

- **Faruk Ahmed**, et al. (2025). DMX: A Weighted Softmax Fusion of Heterogeneous CNNs for Burmese Leaf Disease Classification. *28th International Conference on Computer and Information Technology (ICIT)* (pp. 1654–1659). IEEE.
- **Faruk Ahmed**, et al. (2025). A Comprehensive Review of Machine Learning-Based Approaches for Malware Detection. *5th International Conference on Emerging Smart Technologies and Applications (eSmarTA)*, pp. 1–8.
- **Faruk Ahmed**, et al. (2024). Drug Addiction Analysis in Bangladesh Using Machine Learning. *15th International Conference on Computing Communication and Networking Technologies (ICCCNT)*, pp. 1–7. IEEE.
- **Faruk Ahmed**, Emon, Y. R., Ahad, M. T., Munna, M. H., & Mamun, S. B. (2023). A fuzzy-based vision transformer model for tea leaf disease detection. *International Conference on Trends in Computational and Cognitive Engineering*, pp. 229–242. Springer Nature.
- **Faruk Ahmed**, Sagor, S., Hossain, M. F., Faruk, A. B., Reyad, M. Z. I., & Das, I. (2025). GViT: A Customized Vision Transformer Model for Guava Leaf Disease Detection. [Presented] *3rd International Conference on Big Data, IoT and Machine Learning (BIM 2025)*.
- **Faruk Ahmed**, Hasan, M., Hossain, S., Ahmed, F., Hasan, M. K., & Ahmmed, J. (2025). DRX Ensemble: An Optimized Rank-Based Deep CNN Model for Java Plum Leaf Disease Classification. [Presented] *16th International Conference on Computing Communication and Networking Technologies (ICCCNT 2025)*.
- **Faruk Ahmed**, Sagor, S., Ahamed Nelay, M. H., Hossain Asif, M. A., Islam Reyad, M. Z., & Hossain, M. F. (2025). A Computationally Optimized Fine-Tuning Approach for CNN-Based Lung Cancer Detection. [Presented] *16th International Conference on Computing Communication and Networking Technologies (ICCCNT 2025)*.
- Hossain, S., **Faruk Ahmed**, et al. (2025). MXD: A Weighted Soft Voting Ensemble of Fine-Tuned CNNs for Blood Cancer Detection from Microscopic Images. [Presented] *16th International Conference on Computing Communication and Networking Technologies (ICCCNT 2025)*.
- Ahmmed, J., **Faruk Ahmed**, Kabir, M. A., Uddin, A. Z. M. J., & Bhuiyan, T. (2025). RVE: An Optimized Ensemble Model for Breast Cancer Detection. [Presented] *5th International Conference on Trends in Electronics and Health Informatics (TEHI 2025)*.

## OPEN-ACCESS DATASETS (Mendeley Data)

Contributed to and published **10 open-access datasets** (CC BY 4.0) covering plant disease imaging, behavioral and social data, and clinical biomedical data — supporting reproducible research and community-driven AI development: **BDSID**, **Social Media & Academic Performance**, **Mango Leaf Annotations**, **BDRubberLeaf**, **TLD-BD**, **Sunflower Plant Health**, **Lychee & Jackfruit Plant Diseases**, **LemonLENS**, **CSAD**, **Drug Use Dynamics**.

## EDITORIAL & REVIEW ACTIVITIES

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- Reviewer, *PLOS ONE* (Public Library of Science, SCI-indexed, Q1 Multidisciplinary Sciences)
- Reviewer, *Biomedical Signal Processing and Control* (Elsevier, SCI-indexed, Q1 Biomedical Engineering & Signal Processing)

## AWARDS & HONORS

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| <b>Award of Distinction</b><br>5th International Data Science Olympiad (IDSOL 2025)<br><i>Top international recognition for applied AI and data science innovation in a global competitive setting.</i> | Hong Kong<br>2025                  |
| <b>2nd Runner-Up, Project Showcasing Track</b><br>VisionX: AI-Powered National Innovation Challenge<br>Organized by the Department of Computer Science and Engineering, University of Dhaka             | Dhaka, Bangladesh<br>November 2025 |
| <b>Honorable Mention (AI Category)</b><br>Blockchain Olympiad Bangladesh (BCOLBD 2025)<br>Organized by Bangladesh ICT Division, BASIS, Bangladesh Computer Council, and others                          | Dhaka, Bangladesh<br>2025          |
| <b>Champion</b> , Crack Dataset Contest 2024<br>DIU NLP Lab, Daffodil International University<br><i>First place in a Machine Learning-based dataset analysis and problem-solving contest.</i>          | Dhaka, Bangladesh<br>2024          |
| <b>Finalist (AI Category)</b><br>Blockchain Olympiad Bangladesh (BCOLBD 2024)                                                                                                                           | Dhaka, Bangladesh<br>2024          |

## SERVICE & OUTREACH

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| <b>Co-Convener, Data Science Club, Daffodil International University</b><br><i>Co-leading student AI literacy initiatives including the National AI Awareness Program Bangladesh (NAIAPB), delivering device-free AI education workshops to students in grades 6–10 across Bangladesh, including underserved communities.</i> | November 2025 – Present       |
| <b>Instructor, Online Machine Learning Course</b><br><i>Designed and delivered a structured ML course to learners across Bangladesh.</i>                                                                                                                                                                                      | Online<br>January–August 2025 |

## ENGLISH PROFICIENCY

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| <b>IELTS (Academic): 7.0</b> (overall score)<br>Listening: 8.5   Reading: 7.5   Speaking: 6.0   Writing: 6.0 | July 2025 |
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## TECHNICAL SKILLS

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- **Programming:** Python (advanced), C/C++, Java
- **AI & Machine Learning:** Deep Learning (CNNs, Vision Transformers), Transfer Learning, Ensemble Learning, Model Optimization, Explainable AI (XAI), Grad-CAM, SHAP, LIME, Edge AI / TinyML
- **Computer Vision:** Image Processing, OpenCV, Feature Extraction, Augmentation, Object Detection, Image Classification
- **Frameworks & Libraries:** PyTorch, TensorFlow, Keras, Scikit-learn, NumPy, Pandas, Matplotlib
- **Research Skills:** Independent research design, academic writing, dataset curation and publication, peer review, student mentoring

## REFERENCES

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### Dr. Imran Mahmud

Professor & Head, Department of Software Engineering  
Daffodil International University, Dhaka, Bangladesh  
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### Dr. Md Alamgir Kabir

Assistant Professor & Coordinator, MIS, Department of Computer Science & Engineering  
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