Md. Redwan Ahmed

redrik278@gmail.com — +8801778205198 — linkedin.com/in/redrik278 — Google Scholar — Website

EXPERIENCE

Research Assistant, East West University Dhaka, Bangladesh
Artificial Intelligence Lab, Supervisor: Prof. Dr. Ahmed Wasif Reza Jan 2022 – Present

- Conducted and presented research at over ten international conferences (IEEE and Springer) across India, Italy, Nepal, and Bangladesh, including multiple Best Paper Awards.
- Supervised and trained more than 200 hundred undergraduate and graduate researchers in AI experimentation, data analysis, and scientific publishing, fostering collaboration across disciplines.
- Designed and deployed Vision Transformer–based systems for medical, agricultural, and educational applications, improving automation and diagnostic precision.
- Integrated AI-driven control and IoT systems to enhance smart infrastructure efficiency and enable real-time autonomous operation.
- Co-led manuscript development and technical report preparation that resulted in publications in peer-reviewed journals and IEEE conferences.
- Collaborated in regular research meetings to address experimental challenges and accelerate progress in multimodal and explainable AI projects.

Research Assistant, Ulster University Coleraine, Northern Ireland
School of Computing, Supervisor: Dr. Nazmul Siddique Jan 2023 – Present

- Investigating multimodal data fusion methods for improved object recognition using large-scale datasets and hybrid Transformer–CNN architectures.
- Developed data preprocessing pipelines that reduced multimodal noise and improved data consistency.
- Implemented optimized feature fusion models capturing both low-level interactions and high-level semantic relationships across visual, audio, and textual modalities.
- Contributed to the creation and annotation of large multimodal datasets for benchmarking feature extraction and model evaluation.
- Evaluated model performance using precision, recall, F1-score, and trustworthiness metrics, preparing results for journal publications and conference presentations.
- Explored real-time deployment of multimodal systems through computational optimization for feasible implementation in edge-AI environments.

Research Assistant, East West University Dhaka, Bangladesh
Center for Research and Training (CRT), Supervisor: Dr. Fakir Mashuque Alamgir Oct 2025 – Present

- Conducting research on multimodal fusion and transformer-based deep learning models for early detection of glaucoma.
- Developing and evaluating an explainable AI (XAI) framework to improve interpretability and clinical trust in medical image diagnostics.
- Designing a mobile application integrating the trained model for real-time glaucoma risk prediction and screening.

SKILLS

- Programming: Python, C++, Java, PHP, JavaScript, SQL, NoSQL, HTML/CSS
- Frameworks and Libraries: PyTorch, TensorFlow, OpenCV, SciPy, NLTK, spaCy, Django, Flask
- Tools and Software: MATLAB, Anaconda, VS Code, Git, LaTeX
- Research and Technical Expertise: Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Transfer Learning, Explainable AI, Federated Learning, Multimodal Learning, Data Preprocessing, Predictive Analytics, Model Optimization, AI-driven Decision Support Systems, Technical Writing

EDUCATION

East West University, Dhaka, Bangladesh June 2025 – Present
Master of Science in Computer Science and Engineering
Major: Data Science

- **Thesis (Ongoing):** Explainable Multimodal Large Language Model for Laryngeal Cancer Diagnosis and Clinical Decision Support.

East West University, Dhaka, Bangladesh Jan 2019 – Sept 2023
Bachelor of Science in Computer Science and Engineering
Major: Data Science CGPA: 3.17/4.00

- **Thesis:** Vision-Audio Multimodal Object Recognition Using Hybrid and Tensor Fusion Techniques, **published in *Information Fusion*, Elsevier, 2025**.

RESEARCH INTERESTS

Bioinformatics, Multimodal Learning, XAI, Federated Learning, Computer Vision, Deep Learning, NLP, Transformers, Human-Computer Interaction, Medical Imaging, AI-driven Threat Detection.

PUBLICATIONS

Peer-Reviewed Journals

- Vision-audio multimodal object recognition using hybrid and tensor fusion techniques, **Information Fusion**, 126, 103667. (Q1: IF 15.5)
- Hierarchical Swin Transformer Ensemble with Explainable AI for Robust and Decentralized Breast Cancer Diagnosis, **Bioengineering**, 12(6), 651. (Q2: IF 3.7)
- ViX-MangoEFormer: An Enhanced Vision Transformer–EfficientFormer and Stacking Ensemble Approach for Mango Leaf Disease Recognition with Explainable Artificial Intelligence, **Computers**, 14(5), 171. (Q1: IF 4.2)
- A Novel MaxViT Model for Accelerated and Precise Soybean Leaf and Seed Disease Identification, **Computers**, 14(5), 197. (Q1: IF 4.2)
- Advancing Early Leukemia Diagnostics: A Comprehensive Study Incorporating Image Processing and Transfer Learning, **BioMedInformatics**, 4(2), 966–991. (Q2: SJR 0.489)
- LMVT: A hybrid vision transformer with attention mechanisms for efficient and explainable lung cancer diagnosis, **Informatics in Medicine Unlocked**, 57, 101669. (Q2: SJR 0.762)
- Explainable Transformer Framework for Fast Cotton Leaf Diagnostics and Fabric Defect Detection, **iScience** (Q1: IF 4.1).

Manuscripts Under Review or Submitted or accepted

- Hallucination-Resistant Tri-Modal Information Fusion with a Multi-Granularity Text-Aware Multimodal LLM, **Information Fusion** (Q1: IF 15.5).
- Adaptive Distribution-Aware Hybrid Transformer with Multi-Scale Tokenization for Robust Medical Image Analysis, Under Review **Medical Image Analysis** (Q1: IF 11.8).
- Multi-Stage Deep Learning Pipeline for Gallbladder Disease Classification: Comparative Analysis of Baseline Models, Semi-Supervised Learning Integration, and Novel Self-Supervised Foundation Model Fusion (Submitted) **Medical Image Analysis**, (Q1: IF 11.8)
- Semi-Supervised Learning for Calibrated and Label-Efficient Retinal Disease Identification, **Knowledge-Based Systems** (Q1: IF 7.6).
- Communication-Aware Federated Self-Supervised Learning for Intelligent IoT Intrusion Detection System, **Knowledge-Based Systems** (Q1: IF 7.5).
- Aspect-Aware Multimodal Sentiment Analysis of E-Commerce Reviews via Contrastive Graph Fusion for Business Intelligence, Submitted **Information Sciences** (Q1: IF 6.8).
- Efficient and Robust Transformer-Based Facial Screening for Explainable Autism Spectrum Disorder Identification, **Array** (Q1: IF 4.5).
- DepTformer-XAI-SV: A Novel Ensemble Transformer Model for Fast and Accurate Depression Emotion and Severity Analysis, **iScience** (Q1: IF 4.1)
- LightVTD: Lightweight Explainable Vision Transformer with Multi-Path Token Fusion for Drowsiness Detection (Under Review) **Scientific Reports** (Q1: IF 3.9).
- Facial Emotion Recognition Using Deep Learning to Identify Problems Related to Mental Health, (Under Review) **Scientific Reports** (Q1: IF 3.9).
- MaizeFormerX: An Explainable and Lightweight Vision Transformer with Dual-Scale Architecture for Early Detection of Maize Leaf Disease, **Scientific Reports** (Q1: IF 3.9)
- Goldenhar Syndrome Detection with OD-Mamba Backbone for Explainable Rare Craniofacial Disorder Diagnosis, **Scientific Reports** (Q1: IF 3.9)

Selected Conference Papers

- Efficient Web-Based Automated Poultry Disease Detection Using Transfer Learning Models, **INCIP 2025** (Best Paper Award).
- Towards Automated Detection of Tomato Leaf Diseases, **ICEEICT 2024** (Best Paper Award).
- Web Application-Based Enhanced Esophageal Disease Diagnosis in Low-Resource Settings, **BECITHCON 2024**.
- Robust Phishing URL Classification Using FastText Character Embeddings and Hybrid Deep Learning, **RAAICON 2024**.
- Hybrid Vision Transformer Model for Accurate Prostate Cancer Classification in MRI Images, **ECCE 2025** (Best Paper Award).
- Transforming Leukemia Classification: A Comprehensive Study on Deep Learning Models for Enhanced Diagnostic Accuracy, **PEEIACON 2024**.
- Parasitology Unveiled: Revolutionizing Microorganism Classification Through Deep Learning, **ICEEICT 2024**.
- Transformer-Based Ensemble Model for Binary and Multiclass Oral Cancer Segmentation, **ECCE 2025** (Best Paper Award).
- Ensemble-Based Explainable Approach for Rare Medicinal Plant Recognition and Conservation, **ICINT 2025** (Best Paper Award).
- Monkeypox Lesion Classification: A Transfer Learning Approach for Early Diagnosis and Intervention, **IC3I 2024** (Best Paper Award).

Conference Under Review

- BASFL-IDS: Bandwidth-Aware Federated Self-Supervised Learning for IoT Intrusion Detection
- Multi-Level Domain Adaptation with Prompts, Adapters, and Sparse Experts for Intraoral Imaging

- Explainable Transformer-Based Models for Land Use and Land Cover Classification.
- Capturing Cross-Product Dependencies with a Hybrid Transformer for Supply Chain Demand Forecasting.

AWARDS

Best Paper, 4th International Conference on Electrical, Computer and Communication Engineering May 2023
Best Paper, 6th International Conference on Electrical Engineering and Information & Communication Technology May 2024
Best Paper, International Conference on Next Generation Communication & Information Processing Jan. 2024
Best Paper, 7th International Conference on Contemporary Computing and Informatics Sept. 2024
Best Paper, International Conference on Electrical, Computer and Communication Engineering Feb. 2025

PRESENTATIONS

Attended Conferences

- Presented at **ICIPCN-2023** on Innovative Method for Alzheimer's Disease Detection Using Convolutional Neural Networks
- Presented at **ICEEICT-2024** on Towards Automated Detection of Tomato Leaf Diseases
- Presented at **PEEIACON 2024** on Transforming Leukemia Classification: A Comprehensive Study on Deep Learning Models for Enhanced Diagnostic Accuracy
- Presented at **IC3I 2024** on Monkeypox Lesion Classification: A Transfer Learning Approach for Early Diagnosis and Intervention
- Presented at **RAAICON 2024** on Robust Phishing URL Classification Using FastText Character Embeddings and Hybrid Deep Learning
- Presented at **ECCE 2025** Hybrid Vision Transformer Model for Accurate Prostate Cancer Classification in MRI Images
- Presented at **INCIP 2025** on Efficient Web-Based Automated Poultry DiseaseDetection Using Transfer Learning Models
- Presented at **QPAIN 2025** on A Novel Transformer Model for Accelerated and Efficient Cotton Leaf Disease Identification

PROFESSIONAL ACTIVITIES

- Reviewer for **Elsevier**: Computer Speech & Language; Expert Systems with Applications; Biomedical Signal Processing and Control; Information Fusion; Intelligent Systems with Applications; Engineering Applications of Artificial Intelligence. 2024–2025
- Reviewer for **Springer**: Cognitive Neurodynamics; International Conference on Artificial Intelligence and Computing. 2025
- Reviewer for **Mindspace**: 2nd International Conference on Traditional & Alternative Medicine. 2025
- Organizer for **IIMCSE2026:** International Innovations on Computer Science and Engineering Jun 2026

INVITED TALK

- World Summit and Expo on Robotics, AI, and Machine Learning (ROBOTICS-2026), **Rome, Italy** Mar 2026,
- International Congress on Biomedical Engineering and Applications (BEACONGRESS2026), **Portugal** Mar 2026
- International Congress on Smart Agriculture 2026 (SAG 2026), **Singapore** Apr 2026
- World Congress of Food and Nutrition (WCFN-2026), **Helsinki, Finland** Jul 2026
- International Conference on Public Health and Health Care System (ICPHHCS 2025),**Paris, France** Dec 2025

RESEARCH PROJECTS

Multimodal Glaucoma Detection *(Collaboration: CRTEWU and Vision Eye Hospital, Dhaka)* Nov 2025 – Present

- Developing a semi-supervised self-attention model for calibrated multimodal fusion to enable real-time glaucoma detection in clinical settings.

In-Line Fabric Defect Detection *(Collaboration: East West University and Knitasia Ltd.)* July 2026 – Present

- Building a retrofit computer-vision system for real-time fabric fault detection and quality grading, with a web-based dashboard for factory deployment.

Psychophysics-EEG Mental Health Screening *(Collaboration: CRTEWU and MindSheba)* Oct 2025

- Developed a psychophysics-driven EEG framework for early detection and risk stratification of anxiety and depression among EWU students.

Tomato Leaf Disease Detection *(Collaboration: EWU and BIRD)* Sept 2025

- Proposed XSVC (XceptionNet+SVC) for 10-class tomato leaf disease identification using 60,000 augmented images, achieving 99.51% accuracy, and deployed an Android predictor app.

INTERPERSONAL & PROFESSIONAL DEVELOPMENT

- Collaborated with research teams to deliver project outcomes.
- **Student Mentor, East West University** (Feb 2022 – Sept 2023).
- Organized/participated in academic events and data science hackathons.
- Completed professional training and workshops in data science, ML, and research writing.