

Mohammad Amanour Rahman

Dhaka, Bangladesh | E-mail | Portfolio | Google Scholar | ORCID
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SUMMARY

Research-oriented Computer Science and Engineering graduate with expertise in medical image analysis, computer vision, deep learning, and explainable AI. Experienced in independently leading end-to-end research projects, including problem formulation, model development, experimental design, and scientific writing, resulting in peer-reviewed publications and international conference papers. Seeking to contribute to impactful AI research by developing robust, interpretable, and clinically relevant machine learning solutions for healthcare.

RESEARCH INTERESTS

Medical Image Analysis · Computer Vision · Deep Learning · Explainable Artificial Intelligence (XAI) · AI in Healthcare · Multimodal Learning · Trustworthy AI · Representation Learning · Federated Learning

EDUCATION

- **Ahsanullah University of Science and Technology (AUST)** 2022 – 2026
Bachelor of Science (B.Sc.) in Computer Science and Engineering Dhaka, Bangladesh
 - **Thesis (Lead Researcher):** *Automated Brain Hemorrhage Detection, Segmentation, and Severity Quantification from Non-Contrast CT Using a Hybrid Deep Learning Framework*
 - **Relevant Coursework:** Artificial Intelligence, Machine Learning, Deep Learning, Pattern Recognition, Digital Image Processing, Soft Computing, Mathematical Analysis for Computer Science

PUBLICATIONS

Journal Articles

- [1] **Mohammad Amanour Rahman**, Rowzatul Zannath Prerona. *Spectral-Spatial Mamba with Uncertainty-Guided Refinement for Thyroid Nodule Diagnosis*. **Array**, Elsevier, 2026. DOI: [10.1016/j.array.2026.101058](https://doi.org/10.1016/j.array.2026.101058)
- [2] **Mohammad Amanour Rahman**. *HyFormer-Net: A Synergistic CNN-Transformer with Interpretable Multi-Scale Fusion for Breast Lesion Segmentation and Classification in Ultrasound Images*. **Intelligence-Based Medicine**, Elsevier, 2026. <https://doi.org/10.1016/j.ibmed.2026.100413>
- [3] **Mohammad Amanour Rahman**. *Joint Thyroid Nodule Segmentation and TI-RADS-Aligned Boundary Morphology Typing via a Dual-Head Network Trained on Automatically Generated Pixel-Level Labels*. **Scientific Reports**. Under Review.
- [4] **Mohammad Amanour Rahman**. *TCB-Net: Topology-Constrained Boundary-Interior Decoupled Network for Breast Ultrasound Lesion Segmentation*. **IET Image Processing**. Under Review.

Conference & Workshop Papers

- [5] **Mohammad Amanour Rahman**. *MedSaab-US: A Backpropagation-Free Multi-Scale Wavelet-Saab Framework for Thyroid Nodule Segmentation in Ultrasound Images*. **IEEE ICIP 2026 Satellite Workshop**. Accepted. [\[arXiv\]](#)
- [6] **Mohammad Amanour Rahman**. *RadiomicNet: A Hybrid Radiomics-Guided Lightweight Architecture for Interpretable Medical Image Segmentation*. **IEEE ICIP 2026 Satellite Workshop**. Accepted. [\[arXiv\]](#)

PROJECTS

•Deforestation Mapping in Dhaka – Semantic Segmentation

- Developed a high-resolution satellite imagery dataset (2012–2022) and implemented deep learning models for semantic segmentation of deforested regions.
- Evaluated U-Net variants using Dice, IoU, F1-score, Precision, and Recall. **Tech:** Python, TensorFlow, PyTorch, OpenCV.

•EfficientNet-CBAM for Brain Tumor Classification

- Developed an EfficientNetB3-CBAM framework for multi-class brain tumor MRI classification, achieving **99.29% accuracy**.
- Integrated HiResCAM for explainability and benchmarked against state-of-the-art CNN models. **Tech:** TensorFlow, Keras, OpenCV.

ACADEMIC SERVICE

•Peer Reviewer – *NED University Journal of Research*

- Reviewed manuscripts in artificial intelligence, computer vision, and medical image analysis; provided structured evaluations assessing methodological rigor, experimental validity, and scientific contribution.

•Open-Source Contributor – Project MONAI (NVIDIA)

- Resolved a documentation defect in the *PerceptualLoss* module (Issue #8592) of Project MONAI, an NVIDIA-supported medical imaging deep learning framework; contribution improves usability and research reproducibility for the broader community.

RESEARCH SOFTWARE

•MedXAI – Open-Source Python Toolkit for Medical Imaging AI

PyPI | *GitHub*

- Independently developed and maintain **MedXAI**, a lightweight open-source Python toolkit for reproducible medical imaging AI research; distributed via PyPI and GitHub.
- Provides modular utilities covering segmentation metrics, custom loss functions, image preprocessing, radiomics feature extraction, and Explainable AI (GradCAM); built for PyTorch-based research workflows.

TECHNICAL SKILLS

Programming Languages: Python, C/C++, Java, MATLAB

Deep Learning Frameworks: PyTorch, TensorFlow, Keras, MONAI

Computer Vision & Image Processing: OpenCV, scikit-image, Albumentations, Pillow

Scientific Computing & Data Analysis: NumPy, SciPy, Pandas, Matplotlib

Research & Software Development: Git, GitHub, GitHub Actions, PyPI, Jupyter Notebook, Google Colab, Visual Studio Code

Documentation: LaTeX, Overleaf