

# Md. Akmol Masud

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## ABOUT ME

I am a versatile machine-learning researcher with a strong background in computer vision, quantum machine learning, and semi-supervised learning. My expertise spans developing innovative solutions for healthcare diagnostics, particle physics analysis, and various computer vision applications. I excel in quantum-classical hybrid systems and deep learning architectures, particularly for medical image analysis. I am passionate about leveraging cutting-edge technologies to solve real-world problems and drive impactful results.

## RESEARCH INTERESTS

Semi-supervised Learning, Quantum-Classical Neural Networks, Computer Vision, Deep Learning, Explainable AI, Graph Neural Networks, Data Science, Statistical Analysis

## PUBLICATIONS

- [1] Md Abrar Jahin, Md Akmol Masud, MF Mridha, Zeyar Aung, and Nilanjan Dey. Kacq-dcnn: Uncertainty-aware interpretable kolmogorov-arnold classical-quantum dual-channel neural network for heart disease detection. *arXiv preprint arXiv:2410.07446*, 2024.
- [2] Md Abrar Jahin, Md. Akmol Masud, Md Wahiduzzaman Suva, M. F. Mridha, and Nilanjan Dey. Lorentz-equivariant quantum graph neural network for high-energy physics. 2024.
- [3] Md Abrar Jahin, Md. Akmol Masud, M. F. Mridha, and Nilanjan Dey. Quantum rationale-aware graph contrastive learning for jet discrimination. 2024.

## RESEARCH EXPERIENCE

- **Undergraduate Thesis:** Developed MosQNet-SA, an explainable convolutional-attention network for mosquito classification, creating a novel dataset and implementing transfer learning techniques with REST API integration.
- **Quantum-Classical Hybrid Systems:** Contributed to developing KACQ-DCNN, a novel quantum-classical hybrid architecture for heart disease detection with uncertainty quantification.
- **Particle Physics Analysis:** Implemented Lorentz-equivariant quantum graph neural networks for high-energy physics applications, focusing on particle trajectory analysis.

**GitHub Portfolio:** Explore my projects on GitHub

**Kaggle Profile:** View my competition entries on Kaggle

## EDUCATION

**Institute of Information Technology, Jahangirnagar University** Dhaka, Bangladesh  
B.Sc. in ICT; CGPA: 3.29/4.0 (8th semester: 3.6) July 2024

**Academic Transcript:** View Full Transcript

**Thesis:** MosQNet-SA: An Explainable Convolutional-Attention Network for Mosquito Classification with Potential Application as a RESTful API for Dengue and Malaria Risk Mapping

**Sylhet Cadet College** Sylhet, Bangladesh  
Higher Secondary Certificate (HSC); GPA: 5.0/5.0 May 2018  
Secondary School Certificate (SSC); GPA: 5.0/5.0 May 2016

**HSC Certificate:** View HSC Certificate **SSC Certificate:** View SSC Certificate

## RESEARCH AND PROJECTS

- [MosQNet-SA](#)  
Implemented an advanced CNN-attention hybrid architecture for accurate mosquito species classification, contributing to disease surveillance systems.
- [Clickshots Python Package](#) Building a comprehensive Python package for automated screenshot capture and processing with advanced image manipulation capabilities. Expected completion: Jan 2025.
- [Alzheimer's Image Augmentation using PseudoRGB](#)  
Novel application of PseudoRGB augmentation techniques for enhanced Alzheimer's disease detection, demonstrating improved model performance.

- **Heart Disease Analysis and Prediction**

Conducted comprehensive statistical analysis and implemented machine learning models for heart disease prediction [1], achieving significant accuracy improvements through innovative feature engineering.

- Sleep Apnea Detection Research

Implementing novel deep learning architectures for sleep apnea detection through ECG signal analysis and spectrogram processing, focusing on automated diagnosis and monitoring.

## ACHIEVEMENTS

- 37th place in the CUET ETE Day 2023 ML Competition (NLP and DL) *12 Nov 2023 - 23 Nov 2023* Ranked 37th out of 200+ participants, showcasing problem-solving skills in NLP and deep learning under tight deadlines.
- 63rd place in the DL Enigma 1.0 - SUST CSE Carnival 2024 (Computer Vision) *20 Jan 2024 - 10 Feb 2024* Secured 63rd place in a competitive event, focusing on model tuning, optimization, and large-scale dataset processing for computer vision tasks.
- Duke of Edinburgh Leadership Award (Bronze Standard) *28 Feb 2027* Recognized for leadership, teamwork, and project management through the Duke of Edinburgh's Award program.

## AFFILIATION

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|--|----------------------------|
| <ul style="list-style-type: none"> <li>● <b>IEEE JU Student Branch</b><br/>Media and Communications Lead &amp; Membership Development Lead<br/>Spearheaded strategic communications and membership growth initiatives, resulting in a 40% increase in branch visibility and active participation across technical events and workshops.</li> </ul> | <i>Feb 2022 – Aug 2024</i> |
| <ul style="list-style-type: none"> <li>● <b>E-Business &amp; Entrepreneurship Club, JU</b><br/>Executive<br/>Orchestrated impactful entrepreneurship workshops and networking events, facilitating meaningful connections between students and industry leaders while nurturing innovative business ideas.</li> </ul>                              | <i>Mar 2019 – Jun 2022</i> |
| <ul style="list-style-type: none"> <li>● <b>IIT-JU Sports Club</b><br/>President<br/>Provide strategic leadership to a 50-member organization, spearheading diverse athletic programs and wellness initiatives to enhance student physical and mental well-being.</li> </ul>   | <i>Jan 2024 – Present</i>  |

## TECHNICAL SKILLS

- **Programming Languages:** Python (LeetCode Profile), C++ , JavaScript, Java
- **ML/DL Frameworks:** TensorFlow, PyTorch, OpenCV, Scikit-Learn
- **Research Tools:** LaTeX, Git, Docker, Jupyter, Linux
- **Specialized Skills:** Quantum Computing, Signal Processing, Statistical Analysis
- **Development:** FastAPI, Django, RESTful APIs, Database Design

## EXTRACURRICULAR ACTIVITIES

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- 1st place, 110m hurdles, 47th Annual Athletics Competition, JU Certificate