

Mahmudul Hoque

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EDUCATION

Morgan State University	5/2025 M.S. , Advanced Computing, GPA: 3.77/4.0 ▷ <i>Best Thesis in MS</i> , Department of Computer Science, 2025 ▷ <i>IBM Masters Fellowship Award</i> , 2024
North South University	8/2022 B.S. , Computer Science and Engineering, GPA: 3.73/4.0 ▷ <i>Undergraduate Merit Scholarship</i> , 2018

RESEARCH EXPERIENCE

My research interests lie in the development of generative and vision-language models that are more robust, interpretable, and efficient for high-stakes domains.

National Institute of Standards and Technology (Gaithersburg, MD, USA)	6/2024 – 6/2025	Research Associate Supervisor: Dr. F. H. Kim Engineering Laboratory
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TEACHING EXPERIENCE

Morgan State University Computer Science (Baltimore, MD, USA)	8/2025 – present	Graduate Teaching Assistant Introduction to Data Science Instructor: Dr. M. M. Rahman
North South University Mathematics & Physics (Dhaka, BD)	8/2021 – 4/2022	Undergraduate Teaching Assistant Physics II, Probability and Statistics Instructor: Dr. Z. Mahbub, Dr. I. Jahan

DATASETS

- **M. Hoque** and F. H. Kim. “A dataset of synthetic additive manufacturing lack-of-fusion pores generated using a three-dimensional Generative Adversarial Network based on X-ray computed tomography images.” *National Institute of Standards and Technology*. 2025.

RECENT PUBLICATIONS

All papers listed are published except where indicated as under review.

- [1] **M. Hoque** and F. H. Kim. “Generative modeling of additive manufacturing lack-of-fusion defects using three-dimensional adversarial network: Dataset development and applications in XCT simulation.” *NIST Advanced Manufacturing Series*. 2025. (In review)
- [2] **M. Hoque**, R. N. Chowdhury, M. R. Hasan, E. P. O. Oluwafemi, F. Khalifa, and M. M. Rahman. “An Empirical Evaluation of Low-Rank Adapted Vision–Language Models for Radiology Medical Image Captioning.” *Bioengineering*. 2025. (Accepted)

- [3] **M. Hoque**, M. R. Hasan, Md. I. S. Emon, E. P. O. Oluwafemi, M. M. Rahman, and F. Khalifa. “Comparative Analysis of Fine-Tuned Multimodal Models in Radiology Image Captioning.” *IEEE International Conference on Computing and Machine Intelligence (ICMI)*. 2025.
- [4] Md. I. S. Emon, **M. Hoque**, M. R. Hasan, F. Khalifa, and M. Rahman. “A novel vision transformer-based approach to detect generative model fingerprint.” *SPIE Medical Imaging: Imaging Informatics*. 2025.
- [5] E. P. O. Oluwafemi, **M. Hoque**, E. F. Akor, R. N. Chowdhury, A. Umar, and M. M. Rahman. “Solving Medical Data Limitations Through AI: Multi-Modal Vision-Language Learning for Gastrointestinal VQA and Synthetic Training Data Generation.” *CLEF Working Notes*. 2025.
- [6] E. P. O. Oluwafemi, B. D. Tunde, **M. Hoque**, D. Briggs, M. M. Rahman, and F. Khalifa. “Colonoscopy Image Synthesis: Transforming Medical Image Classification With Enhanced Quality and Computational Efficiency.” *IEEE International Conference on Computing and Machine Intelligence (ICMI)*. 2025.

RESEARCH FUNDING

- NSF ACCESS computational allocation as PI (ID#CIS251271), 750K credits, 2025–2026.

SERVICE

- Peer reviewer, IEEE Journal of Biomedical and Health Informatics, 2025–present.
- Peer reviewer, IEEE Access, 2025–present.
- Executive Board Member, Bangladesh Student Association, Morgan State University, 2024–present.
- Executive Board Member, Graduate Student Association (School of Computer, Mathematical & Natural Sciences Representative), Morgan State University, 2024–2025.
- Data Analyst Intern, iFarmer Ltd. (Dhaka, Bangladesh), 2023.