

# MD ALOMGEER HUSSEIN

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## PROFESSIONAL SUMMARY

Ph.D. student in Information Systems with expertise in Large Language Models (LLMs), Natural Language Processing (NLP), and Machine Learning. Experienced in developing scalable solutions that combine multimodal AI, generative AI, and Agentic AI workflows to address real-world challenges. Skilled at fine-tuning LLMs, building explainable AI systems, and applying advanced analytics to complex datasets. Recognized for publications, grant-funded projects, and leadership in cross-disciplinary AI research.

## EDUCATION

Ph.D. in Information Systems, University of Maryland, Baltimore County.	August 2022 - Present
M.Sc. in Information Systems, University of Maryland, Baltimore County.	August 2022 - December 2024
	GPA: 3.84/4.0
M.Sc. in Electrical and Electronic Engineering, University of Dhaka, Bangladesh.	December 2015 - October 2017
B.Sc. in Electrical and Electronic Engineering, University of Dhaka, Bangladesh.	January 2011 - December 2015

## SKILLS SUMMARY

Programming & Tools:	Python, R, SQL, PyTorch, TensorFlow, HuggingFace, Keras, NumPy, Pandas, MATLAB, OpenCV, Git, Docker
ML/AI Expertise:	Supervised and Unsupervised Learning, GenAI (GAN, VAE, Diffusion), LLM, Transformer, Fine-tuning (PEFT), RLHF, RAG, Agentic AI, Explainable AI
Platforms & Infrastructure:	AWS, Google Cloud Platform, Vertex AI, Linux, SQL

## EXPERIENCE

Research Assistant at CareResearchLab - University of Maryland, Baltimore County. Spring 2025 - Present  
*Building a Framework and Toolkit for Effective Participatory AI Engagement in Hard-to-Reach Populations.*  
Funded by: Google Society-Centered AI Grant

- Leading a Google-funded project to build a participatory AI framework that empowers underserved patients in low-income areas to understand and use their medical records.
- Collaborating with Baltimore community health organizations to enhance health literacy and address healthcare access disparities.

*A Patient-centered Approach to Evaluating Large Language Model-generated Responses to Patients' Questions.*  
(Under Review-JMIR)

- Conducted a study to evaluate Large Language Models (LLMs) on their ability to provide patient-centered responses for laboratory test questions, focusing on readability, completeness, personalization, transparency, and emotional support.
- Comparing LLM responses to those from an online health community to assess alignment with patient support needs.

*Patient-facing AI: Current Status, Challenges, and Opportunities – A Systematic Review.* (Manuscript)

- Conducting a systematic review on patient-facing AI, examining current AI methods, intended uses, and sociotechnical implications in healthcare tools.
- Identifying trends, challenges, and research opportunities to guide future advancements in patient-centered AI applications.

## PROJECTS

*QnA: An LLM-Powered Conversational Agent (CA) for Supporting Colorectal Cancer Knowledge* Fall 2024

- Fine-tuning the Meta LLaMA-2 7B Chat HF model to develop a conversational agent that provides accurate, empathetic, and accessible answers about colorectal cancer, improving health literacy for underserved communities.
- Utilizing a dataset of over 1,000,000 posts and comments from online health communities, employing 4-bit quantization and LoRA fine-tuning to optimize computational efficiency and adapt the model to domain-specific challenges.

*From Data to Topography: A Deep Learning Approach to Predict Ice Bed.* Spring 2023

- Designed a deep learning model with dense and LSTM layers to predict Greenland’s ice bed topography, addressing sparse satellite data by utilizing surface features.
- Achieved promising results compared to traditional machine learning models in accurately estimating the ice bed map.

***Exploring Causality between Arctic Sea Ice and Climate Variability Using Advanced Time Series Analysis.***  
Spring 2023

- Applied advanced causal discovery techniques, including DC, CIV, Variable-lag Granger Causality, and Transfer Entropy, to explore linkages between sea ice extent and climate variables.
- Used causal inference models to quantify the impact of different causal relationships on the Arctic system, highlighting key drivers of sea ice changes.

***Detecting Fraudulent Job Postings Using NLP and Machine Learning.*** Fall 2022

- Developed an NLP-based classifier to distinguish between real and fake job postings, utilizing the Kaggle dataset of 17,880 job descriptions.
- Employed machine learning algorithms, including Multinomial Naive Bayes, K-Nearest Neighbors, and Support Vector Machine, to enhance the detection of deceptive job ads and improve job market safety.

## TEACHING ASSISTANT EXPERIENCE

***University of Maryland, Baltimore County*** Spring 2023 - Fall 2024

Led classes for 36 to 200 students, collaborated on course development and grading, managed online student engagement, and provided individual tutoring.

### Courses Taught:

- Fall 2023, Fall 2024: IS 410 (Introduction to Database Design), IS 310 (Software and Hardware Concepts)
- Spring 2023, Spring 2024: IS 295 (Intermediate Business Applications), IS 325 (Introduction to Management Science)

## RELEVANT COURSES

**Academic:** Deep Learning, Casual AI, Data Mining, Ethical and Responsible AI, Health Informatics, Human-Computer Interaction, Digital Health Equity.

**Online:** Machine Learning (Stanford CS229), Deep Learning for NLP (Stanford CS224d), Advanced NLP (CMU CS 11-711).

## AWARDS & HONORS

- **Honorable Mention, COEIT Research Day Student Award** 2025  
University of Maryland, Baltimore County — Poster recognized for outstanding contribution to research.

## PUBLICATIONS

**Journal:** Md. A. Hussein, Md. T. B. Noman, Md. A. R. Ahad. *A Study on Tiredness Measurement using Computer Vision.* Journal of the Institute of Industrial Applications Engineers, Vol. 7, No. 4 (2019), pp. 110–117.

**Journal:** M.A. Islam, M.Z.H. Majumder, M.A. Hussein, et al. *Chronic Kidney Disease Prediction based on Machine Learning Algorithms.* Journal of Pathology Informatics, 2023.100189.

**Journal:** Islam, M.A., Majumder, M.Z.H., Hussein, M.A., et al. *A Review of Machine Learning and Deep Learning Algorithms for Parkinson’s Disease Detection using Handwriting and Voice Datasets.* Heliyon, 2024.

**Conference:** Md Imranur Rahman Akib, Md Alomgeer Hussein, et al. *From Code to Career: Assessing Competitive Programmers for Industry Placement.* Accepted at the 2025 IEEE International Conference on Quantum Photonics, Artificial Intelligence, and Networking (QPAIN).

## LEADERSHIP & SERVICE

- **Research Mentor, AI/ML Research, UMBC** 2023–Present  
Mentoring both undergraduate and graduate students — supervised a senior-level student on dataset analysis and academic writing, and currently guiding a Master’s student on LLM-based research design, data analysis, and manuscript preparation.
- **Reviewer, AMIA, CHI (Ongoing)** 2024, 2025  
Reviewed submissions in health informatics and AI, providing feedback on methodology and contributions.
- **Team Leader, Sakura Science Exchange Program, Japan Science and Technology Agency** Dec 2019  
Led a team of five in a cross-cultural scientific exchange, coordinating projects to promote international collaboration.