MD ALOMGEER HUSSEIN

+1(443) 938-5849 ◇ Baltimore, Maryland
mdalomh1@umbc.edu ◇ LinkedIn ◇ https://alomgeer007.github.io/portfolio/

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
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

Languages: Python, R, MATLAB, C
Frameworks: Tensorflow, Keras, PyTorch, Numpy, Pandas, Matplotlib, SciKit-Learn, HuggingFace, NLPTK, OpenCV
Algorithm: Explainable AI, Multi-Modal Machine Learning, Large Language Model (LLM), NLP, GenAI, Health IT
Miscellaneous: AWS, Google Cloud Platform (GCP), Vertex AI, SQL, Linux, Git, Docker

WORK EXPERIENCE

Sakura Science Exchange Program- Japan December 2019

- Worked on "Gaze-Based Confidence Estimation on Multiple-Choice Questions," a system that estimates confidence while solving multiple-choice questions by eye-tracking and gives feedback about which question should be evaluated carefully.

Research Assistant at iHARP: NSF HDR Institute for Harnessing Data and Model Revolution in the Polar Regions- UMBC Fall 2022

- Contributed to research on Multivariate Time Series Forecasting using Graph Neural Networks focused on the Greenland ice sheet, enhancing predictive modeling capabilities in polar studies.

Research Assistant at CareResearchLab - UMBC 2024 - 2025

Projects I am Working On:

Building a Framework and Toolkit for Effective Participatory AI Engagement in Hard-to-Reach Populations.

Funded by: Google Society-Centered AI Grant 2024 - 2025

- 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.

Health Access through AI: Fine-Tuned LLMs for Answering Colorectal Cancer Questions in Low-Income Communities.

- Fine-tuning LLMs to create a conversational agent that delivers accessible, reliable answers about colorectal cancer for underserved communities.
- Leveraging a dataset of over 1,000,000 colorectal cancer-related posts and comments from an online health community to train the agent to enhance health literacy in low-income areas.

A Patient-centered Approach to Evaluating Large Language Model-generated Responses to Patients' Questions. (Manuscript)

- Conducting 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

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

- 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.

- 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.

Real-Time Face-Tracking Flight Control for Tello Drone Using Facial Recognition.

- Developed a Python-based flight control program for the Tello drone using facial recognition to detect and track the operator's face in real-time.
- Integrated Tello SDK, OpenCV, and Djitellopy library to enable the drone to maintain a preset distance, adjust its orientation, and match the operator's flight height.

Detecting Fraudulent Job Postings Using NLP and Machine Learning.

- 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)

PROFESSIONAL SERVICES

- Reviewer for AMIA 2024 Annual Symposium
- Mentored Austyn Nguyen (a senior-level student) on research methodologies, data analysis, and academic writing.

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), CS50's Introduction to Programming with Python from Harvard University.

PUBLICATIONS

Journal: Md. A. Hussein, Md. T. B. Noman and 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 and **M.A. Hussein**. *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.**, Hossain, K. M., Miah, M. S. (2024). *A review of machine learning and deep learning algorithms for Parkinson's disease detection using handwriting and voice datasets.* Heliyon.

LEADERSHIP EXPERIENCE

- **Team Leader, Sakura Science Exchange Program**
  Japan Science and Technology Agency, Japan December 2 - December 22, 2019