

SHADAB HAFIZ CHOUDHURY

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📍 Baltimore, US

Accessibility | Human-AI Collaboration | Responsible NLP | Responsible Multimodal Models

Education

- Aug '23 – May '25 **University of Maryland, Baltimore County**
MS in Computer Science
Thesis - Bridging Language and Emotion for Human-AI Collaboration and Accessibility
- Sept '16 – Dec '20 **North South University**
BS in Computer Science and Engineering
Thesis - NAVI: Navigational Assistance for the Visually Impaired using Computer Vision

Selected Publications

- 2024 A. S. M. Mohsin and **S. H. Choudhury**, "Quantifying Nanoparticles and Monomer-Dimer Distribution in Optical Images using Deep Learning" *ACS Omega*, (accepted, pending minor revisions)
- 2024 A. S. M. Mohsin and **S. H. Choudhury**, "Label-free Quantification of Gold Nanoparticles at the Single-Cell level using a Multi-Column Convolutional Neural Network (MC-CNN)," *Analyst*, vol. 149, no. 8, pp. 2412–2419, Apr. 2024
- 2021 I. J. Ananya, S. Suad, **S. H. Choudhury**, and M. A. Khan, "A Comparative Study on Approaches to Acoustic Scene Classification Using CNNs," in *Advances in Computational Intelligence*, I. Batyrshin, A. Gelbukh, and G. Sidorov, Eds., Cham: Springer International Publishing, 2021, pp. 81–91
- 2021 **S. H. Choudhury**, A. J. Aurin, T. A. Mitaly, and R. M. Rahman, "Predicting the Possibility of COVID-19 Infection using Fuzzy Logic System," *International Journal of Intelligent Information and Database Systems*, vol. 14, no. 3, pp. 239–256, Jan. 2021

Research Experience

- May '24 – Aug '24 **Graduate Research Assistant, University of Maryland, Baltimore County (PI: Dr. Lara Martin)**
Fine-tuned LLMs and trained smaller language models from scratch for emotion-conditioned text generation.
Designed surveys and carried out user studies on emotional representations and how emotion generation capabilities of LLMs align with human expectations.
Analyzed available multimodal affective datasets and designed user interfaces for AAC applications.
- Sept '21 – Aug '23 **Research Assistant, Brac University (PI: Dr. Abu Mohsin)**
Designed custom density mapping CNNs, and used transfer learning and ensembles for novel nanoparticle detection and measurement problems, achieving 78–93% test accuracy across tasks.
Created real-time water quality and quantity, and emergency monitoring dashboards using React, ChartJS, Google Maps API and Firestore.
Enhanced water quality forecasting by 38% over prior work using ARIMA and Regression models; built Flask API to serve real-time predictions.
- Oct '20 – Feb '21 **Undergraduate Directed Research, North South University (PI: Dr. Md. Ashrafuzzaman Khan)**
Analyzed audio signal processing methods for feature extraction based on images and embeddings, then tested multiple neural network-based approaches for classifying environmental audio.
Achieved 93% accuracy from spectrograms and 81% accuracy with lightweight embedding-based models.

Teaching Experience

- Aug '23 – Ongoing **Graduate Teaching Assistant, University of Maryland, Baltimore County,**
TA for CMSC 341 - Data Structures in C++ and Java. Proctored exams, held office hours, and graded projects and homework assignments.
- Feb '20 – Jun '20 **Marker, North South University**
Grader for 4 sections of ENG102 (Introduction to Composition) and ENG105 (Advanced Composition). Proctored exams and quizzes, and graded exams, quiz papers and assignments.

Industry Experience

- Feb '23 – Jun '23** **Python Developer, Dviz Technologies**
Developed prompt engineering pipeline for an LLM chatbot to categorize and recommend construction products
Used GPT 3.5 embeddings XGBoost to categorize products based on product datasheets with 90% accuracy.
- May '22 – Feb '23** **Data Scientist and Machine Learning Engineer, Neovotech**
Built customizable English and Swedish text-to-speech API using FastAPI for automated content creation.
Designed recommender system for matching outfits in shop inventory with in-wild images.
Designed fashionable outfit-generation system from text descriptions using StyleGAN models.
- Feb '22 – May '22** **Data Scientist and Machine Learning Intern, Eucaps AB | Neovotech**
Built 8+ automated data scrapers for data mining financial and stock news sites with Selenium.
Designed pipeline for neural machine translation and summarization of scraped data.

Skills

- Programming** Python, JavaScript
- Technologies** Git, Docker, Linux, MySQL, MongoDB, ImageJ, Google Firebase, Amazon EC2
- Libraries** PyTorch, OpenCV, Pandas, NumPy, Librosa, FastAPI, Matplotlib, SciKit-learn, Django, Flask, Selenium, RabbitMQ, Gradio, Scrapy, BeautifulSoup, ReactJS, SvelteJS

Presentations and Talks

- 2022** **Water Analytics Tools: Quality & Quantity Monitoring & Purification Using IoT, ML & Nanotechnology**
Poster Presentation at Brac University Research Day 2022
- 2020** **Workshop on Python by NSU ACM Student Chapter R&D**
A workshop on Python held internally within NSU ACM Student Chapter. Covered fundamentals of python programming.

Grants and Awards

- 2016 – 2020** Merit-based Scholarship from North South University (50% Tuition Waiver)
- 2015, 2017** The Daily Star O- and A-Level Awards for Academic Excellence
- 2023** (Declined) €1300 Travel Grant for Mediterranean Machine Learning Summer School 2023

Certificates and Additional Education

- July '22** **Deep Learning Summer School, Neuromatch Academy**
Topics covered include MLPs, Optimization and Regularization, Convolutional Neural Networks, Generative Models, Time Series, NLP, Attention and Transformers, and Reinforcement Learning.
- Oct '20 – May '21** **Certificate in Quantum Computing – Qubit x Qubit, The Coding School**
Topics covered include Mathematics for Quantum Physics, Quantum Mechanics, Quantum Programming and Quantum Algorithms.

Volunteering

- 2019 – 2020** **NSU ACM Student Chapter, Chapter Officer, Webmaster**
Organized and led research and development meetings. Assisted organizing workshops on Python and Motion Graphics.
Directed social media presence and outreach of the Chapter. Successfully promoted national-scale competitive events with over 600 participants.
- 2017 – 2018** **NSU ACM Student Chapter, Publications Team Lead**
Ensured regular release of promotional materials for events. Coordinated with North South University's public relations. Also, co-edited three annual student publications

Miscellaneous

- 2024** HackUMBC 2024, Best First-Time Hackers, *Category Winner*
- 2021** Water Innovation Challenge Competition by Bangladesh 2030 Water Resources Group, *Final Round*
- 2018** Wordsmiths 2018 by NSU Department of English and NSU Communications Club. *Second Place*