

EDUCATION







PhD in Computer Science University of Massachusetts Amherst (UMass Amherst), MA, USA	Sep 2019 - Present
Master of Science in Computer Science University of Massachusetts Amherst (UMass Amherst), MA, USA	Feb 2024
Master of Science in Electrical and Electronic Engineering Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh	Jan 2021
Bachelor of Science in Electrical and Electronic Engineering Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh	Feb 2017

WORK EXPERIENCE

Graduate Research Assistant , BioNLP Lab, UMass Amherst, MA, USA <ul style="list-style-type: none"> Advisor: Professor Hong Yu Area of Study: Natural Language Processing, Epidemiology 	Jan 2020 - Present
Applied Scientist Intern , Amazon Machine Learning Accelerate, San Diego, USA <ul style="list-style-type: none"> Team: MLA SPS Developed hallucination localization systems in LLM responses. 	June 2024 - Aug 2024
Applied Scientist Intern , Amazon Alexa AI, WA, USA <ul style="list-style-type: none"> Team: Apex Science Developed a pipeline for generating multimodal content from long-form text 	May 2023 - Sept 2023
Applied Scientist Intern , Amazon Alexa AI, WA, USA <ul style="list-style-type: none"> Team: Context Carryover (CC) Developed synthetic utterance similarity detection dataset and assessed its feasibility 	May 2022 - Sept 2022
Applied Scientist Intern , Amazon Alexa AI, WA, USA <ul style="list-style-type: none"> Team: Context Carryover (CC) Developed tasks to minimize model hallucination for constrained contextual query rewriting (CQR) 	Jun 2021 - Aug 2021
Machine Learning Researcher , Semion Ltd., Dhaka, Bangladesh <ul style="list-style-type: none"> Provided Deep Learning solutions to clients Designed and developed necessary software infrastructures 	Mar 2017 - Feb 2019
Intern , Semion Ltd., Dhaka, Bangladesh	Aug 2016 - Dec 2016

SELECTED PUBLICATIONS

- A. Mitra**, N. Gupta, C. Naik, A. Sethy, K. Bice, Z. Raeesy. “Generating contextual images for long-form text.”, 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING 2024), 2024 
- P. Vashisht, A. Lodha, M. Maddipatla, Z. Yao, **A. Mitra**, Z. Yang, J. Wang, S. Kwon, H. Yu. “UMass-BioNLP at MEDIQA-M3G 2024: DermPrompt—A Systematic Exploration of Prompt Engineering with GPT-4V for Dermatological Diagnosis.”, 6th Clinical Natural Language Processing Workshop, 2024 
- Z. Yang, **A. Mitra**, S. Kwon, H. Yu. “ClinicalMamba: A Generative Clinical Language Model on Longitudinal Clinical Notes”, 6th Clinical Natural Language Processing Workshop, 2024 
- Z. Yang, **A. Mitra**, W. Liu, D. Berlowitz, H. Yu. “TransformEHR: Transformer-based encoder-decoder generative model to enhance prediction of disease outcomes using electronic health records”, Nature Communications, 2023 
- J. Wang, Z. Yao, **A. Mitra**, S. Osebe, Z. Yang, H. Yu. “UMASS_BioNLP at MEDIQA-Chat 2023: Can LLMs generate high-quality synthetic note-oriented doctor-patient conversations?”, ACL 2023 Workshop CLinical NLP, 2023 
- A. Mitra**, R. Pradhan, R. D. Melamed, K. Chen, D. C. Hoaglin, K. L. Tucker, J. I. Reisman, Z. Yang, W. Liu, J. Tsai, H. Yu. “Associations Between Natural Language Processing Enriched Social Determinants of Health and Suicide Death Among US Veterans”, JAMA Network Open, 2023 (nominated for VA Health Services Research & Development Best Paper Award 2023) 
- Z. Yang, S. Wang, B. P. S. Rawat, **A. Mitra**, H. Yu. “Knowledge Injected Prompt Based Fine-tuning for Multi-label Few-shot ICD Coding”, EMNLP Findings, 2022 

8. A. J. Rose, J. S. Lee, D. R. Berlowitz, W. Liu, **A. Mitra**, H. Yu. "Guideline-discordant dosing of direct-acting oral anticoagulants in the veterans health administration", BMC Health Services Research, 2021 
9. **A. Mitra**, H. Ahsan, W. Li, W. Liu, R. D. Kerns, J. Tsai, W. Becker, D. A. Smelson, H. Yu. "Risk Factors Associated With Nonfatal Opioid Overdose Leading to Intensive Care Unit Admission: A Cross-sectional Study", JMIR Medical Informatics, 2021 
10. H. Ahsan, E. Ohnuki, **A. Mitra**, H. Yu., "MIMIC-SBDH: A Dataset for Social and Behavioral Determinants of Health", Machine Learning for Healthcare, 2021 
11. **A. Mitra**, B. P. S. Rawat, D. McManus, H. Yu. "Relation Classification for Bleeding Events from Electronic Health Records: Exploration of Deep Learning Systems", JMIR Medical Informatics, 2021 
12. **A. Mitra**, B. P. S. Rawat, D. McManus, A. Kapoor, H. Yu. "Bleeding Entity Recognition in Electronic Health Records: A Comprehensive Analysis of End-to-End Systems", accepted at *AMIA Annual Symposium*, 2020 
13. **A. Mitra**, K. Ashraf. "Sepsis Prediction and Vital Signs Ranking in Intensive Care Unit Patients", *arXiv preprint arXiv:1812.06686*, 2018 



RELEVANT PROJECTS

• Prompt-based learning for generative NER across multiple domains (Python, PyTorch)	2023
• Generative NER with pointer mechanism and constrained decoding (Python, PyTorch)	2022
• Joint named entity recognition and relation extraction (Python, PyTorch)	2021
• Transferability of the winning tickets in CV and NLP (Python, PyTorch)	2020
• Evaluation of triplet fingerprinting attack for website fingerprinting (Python, Keras)	2020
• Offensive language identification across multiple social media platforms (Python, PyTorch)	2020
• SemRad , a teleradiology solution (Java, JavaFX, SQLite, MySQL)	2018
• Faulty semiconductor wafer detection from machine logs (Python, Tensorflow)	2018
• Finding hotspots in semiconductor wafer logs using LRP algorithm (C++, Python)	2018
• Detection of Arrhythmia based on discrete wavelet transform (DWT) features (Python, Keras)	2018
• HealthGeek , an Android app and Differential Diagnoses , an Amazon Alexa skill (Java, Node.js, Flask)	2017
• Risk factors detection for heart diseases in diabetic patients (Python, Theano)	2017

SKILLS

Programming Languages: Python, Java, MATLAB, R, C, C++
Machine Learning Frameworks: Pytorch, Tensorflow, Keras, Scikit-learn
Other Expertise: Weka, Arduino, L^AT_EX, Git, Microsoft Office

ACHIEVEMENTS

449th among 2172 teams (Top 21%), Human Protein Atlas Image Classification, Kaggle 	2019
355th among 3234 teams (Top 11%), TGS Salt Identification challenge, Kaggle 	2018
Dean's List Award , for academic excellence, BUET, Bangladesh	2013, 2017
2nd Runner up , Inter-University Project Show, BUET, Bangladesh	2015
1st Runner up , Inter School & College Science Festival, Rajuk College, Bangladesh	2010
National Level Scholarship , Bangladesh	2003, 2006, 2009, 2011

TEACHING EXPERIENCE

Fall 2023	Guest Lecturer, COMP.5800: Topics in Computer Science, UMass Lowell
Fall 2020	Guest Lecturer, COMP.5800: Topics in Computer Science, UMass Lowell
Fall 2019	Teaching Assistant, COMPSCI 121: Introduction to Computing

SERVICES

- **Paper Reviewer**
 - EMNLP, JMIR, JMIR Medical Informatics, JMIR AI, npj Mental Health Research, BMC Pulmonary Medicine, Frontiers in Bioengineering and Biotechnology, PLOS One, AMIA annual symposium
- **MS Application Reviewer**, 2023, Manning College of Information and Computer Science, UMass Amherst
- **Mentor**
 - Mentored multiple MS and PhD students on different projects in NLP and multimodal learning