AVIJIT MITRA

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EDUCATION

PhD in Computer Sciences Sep 2019 - Present
University of Massachusetts Amherst (UMass Amherst), MA, USA

Master of Science in Electrical and Electronic Engineering Jan 2021
Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Bachelor of Science in Electrical and Electronic Engineering Feb 2017
Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

WORK EXPERIENCE

Graduate Research Assistant, BioNLP Lab, UMass Amherst, MA, USA Jan 2020 - Present

- Advisor: Professor Hong Yu
- Area of Study: Natural Language Processing, Bioinformatics, Machine Leraning

Applied Scientist Intern, Amazon Alexa AI, WA, USA May 2022 - Sept 2022

- Worked with the context carryover (CC) team
- Developed synthetic utterance similarity detection dataset and assessed its feasibility

Applied Scientist Intern, Amazon Alexa AI, WA, USA Jun 2021 - Aug 2021

- Worked with the context carryover (CC) team
- Developed tasks to minimize model hallucination for constrained contextual query rewriting (CQR)

Machine Learning Researcher, Semion Ltd., Dhaka, Bangladesh Mar 2017 - Feb 2019

- Provided Deep Learning solutions to clients
- Designed and developed necessary software infrastructures

Intern, Semion Ltd., Dhaka, Bangladesh Aug 2016 - Dec 2016

SELECTED PUBLICATIONS

1. 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
2. **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 ProcessingEnriched Social Determinants of Health and Suicide Death Among US Veterans", JAMA Network Open, 2023
3. 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
4. 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
5. **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
6. H. Ahsan, E. Ohnuki, **A. Mitra**, H. Yu., "MIMIC-SBDH: A Dataset for Social and Behavioral Determinants of Health", Machine Learning for Healthcare, 2021
7. **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
8. **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
9. **A. Mitra**, K. Ashraf. "Sepsis Prediction and Vital Signs Ranking in Intensive Care Unit Patients", *arXiv preprint arXiv:1812.06686*, 2018
10. R. Ahsan, **A. Mitra**, S. Omar, M. Z. R. Khan, M. A. Basith. "Sol-gel synthesis of $DyCrO_3$ and 10% Fe-doped $DyCrO_3$ nanoparticles with enhanced photocatalytic hydrogen production abilities", *RSC Advances*, 2018

RELEVANT PROJECTS

- **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, LaTeX, 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
12th among 57 teams (Top 21%), Bengali Handwritten Digit Recognition, Kaggle 2018
Dean's List Award 2013, 2017
2nd Runner up, Inter University Project Show, BUET 2015

TEACHING EXPERIENCE

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

SERVICES

- **Reviewer**
  - JMIR
  - JMIR Medical Informatics
  - JMIR AI
  - npj Mental Health Research
  - BMC Pulmonary Medicine
  - Frontiers in Bioengineering and Biotechnology
  - PLOS One