

# NAFIZ SADMAN

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## RESEARCH EXPERIENCES

**Computing Graduate Research Fellow** (*Big Data Analytics and Management Lab, Queen's School of Computing*)  
Sept 2022 – Present

■ *Cross Affiliation with School of Computing and Faculty of Health Science, Queen's University*  
Supervisor: Professor Farhana Zulkernine, Ph.D., P.Eng and Dr. Nicholas Coffie, Ph.D.

**Automated the extraction and evaluation** of student resident performance (Entrustable Professional Activities) by **analyzing textual information** from assessor notes. This includes **sentiment analysis and spearman correlation** of assessor feedback and committee comments.

■ *Cross Affiliation with School of Computing and School of Rehabilitation Therapy, Queen's University*  
Supervisor: Professor Farhana Zulkernine, Ph.D., P.Eng and Assoc Professor Nora Fayed, Ph.D.

1. **Automated literature filtration with domain-specific BERT, information extraction, and information classification from 8,000 clinical RCT articles with specificity 95%** using domain-specific large language model.
2. Contributed to **grant writeup** (under review).

■ *Internship at Pfizer Canada (with MITACS Accelerate | Oct 2022 - Feb 2023)*

1. **Extracted, transformed, and analyzed unstructured Electronic Health Records** to understand patient clinical characteristics, demographics, and comorbidities using **Pandas, mySQL, numpy, sklearn**, and visualization with **seaborn**. Conducted **statistical prediction with k-means clustering and logistic regression**.
2. Contributed to **paper**: "Diagnosis and management of Alzheimer's disease in primary care: a real-world study in Ontario, Canada" accepted in Journal of Primary Care and Community Health (2025).

## INDUSTRY EXPERIENCES

**Associate Machine Learning Engineer (Internship)**  
*EvenUp Law (US-based AI company for Personal Injury)*

Sep 2025 – Dec 2025

- Explored **GEPA** (evolutionary prompt optimization) and its effectiveness.
- **Created a firmwide relevance dataset** for EvenUp with **LLM-as-judge**, that can be used as an evaluation harness and **retrieval metric monitoring (precision@k, recall@k and NDCG@k)**.
- Implemented **cross-encoder, listwise, and setwise reranking** to improve retrieval metrics.

**Front-end Developer (1 year+)**  
*Smith School of Electrical and Computer Engineering, Queen's University*

Jan 2024 – Present

- Developed a **visualization research tool** for **streaming data** from PID controllers using: **Python Socket IO, HTML5, CSS3, D3 JavaScript**.
- Document tool for **paper publication** on tools (accepted in NFM2025).

**Machine Learning Engineer (3 years)**  
*Silicon Orchard Ltd, Dhaka, Bangladesh*

Aug 2019 - Jul 2022

- Built an internal **HR data analytics** tool based on **BERT**.
- Developed a **Stylometric Analysis** algorithm for **Authorship Attribution**.
- Developed a **deep Reinforcement Learning** algorithms for **recommendation systems**.
- Developed **speech recognition** algorithm for **smart home systems**.

## RESEARCH PROJECTS

Computational Biology	Combinatorial Optimization	Reinforcement Learning	Cyber security
Explainable AI in Radiology Imaging using GradCAM. Paper accepted in BioKDD'25.	Multi-task learning to select best group of classifiers for specific set of tasks.	Imbalanced classification for biomedical datasets using RL for weight distribution.	Using multi-party computation to pass secret messages. Biometric authentication.

## OTHER EXPERIENCES

### **Graduate Teaching Assistant**

Jan 2023 – Present

School of Computing, Queen's University

Multiple CS courses. Duties: Assist with marking, proctoring, conducting lab sessions, and office hours.

### **Community Volunteering**

COMPASA Liaison Officer, Graduate Computing Society, Queen's University

January 2025 – August 2025

VP, Queen's Bangladeshi Student Association, Queen's University

September 2024 – Present

## ACADEMICS

### **Ph.D. Candidate**

Pursuing

School of Computing, Queen's University

XAI in Vision and NLP.

### **M.Sc in Cybersecurity**

Degree Conferred

School of Computing, Queen's University

Thesis: Passive Liveness Detection using Depth and rPPG for Face Presentation Attack Detection

## CERTIFICATIONS

- Deep Learning Certification by *Deeplearning.AI*
- TensorFlow in Practice Certification by *Deeplearning.AI*

## PUBLICATIONS

### Highlights:

- Sadman, N., Alaca, F., Zulkernine, F. (2026 January). DepthPulse+: A Depth and Vital Sign Based Method for Face Presentation Attack Detection. IEEE International Conference on Communications (ICC'26) — Track: Communications and Information Systems Security (CISS).
- Sadman, N., Zulkernine, F., Kwan, B. (2025 August). Interpreting Biomedical VLMs on High-Imbalance Out-of-Distributions: An Insight into BiomedCLIP on Radiology. In the 24<sup>th</sup> International Workshop on Datamining in Bioinformatics (BioKDD 25).
- Sadman, N., Kiener, N., Kauffman, S. (2025 April). Visualizing Temporal Interval Hierarchies. In the 17<sup>th</sup> NASA Formal Methods (NFM).
- Sadman, N., Hasan, K.A., Rashno, E., Alaca, F., Tian, Y., Zulkernine, F. (2023 December). Vulnerability of Open-source Face Recognition Systems to Blackbox Attacks: A Case Study With InsightFace. In 2023 IEEE Symposium on Computational Intelligence in Cyber Security (IEEE CICS)}.

**First Authored Publication:** 12 Venues: KDD, ICML, ICMLA, SSCI, ICSSOFT, ICSEA, CCWC

**Google Scholar Citations:** <https://scholar.google.com/citations?user=M3FEjQsAAAAJ>

## **REFERENCES**

**Dr. Farhana Zulkernine, Ph.D., P.Eng.**

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