Mirza Farhan Bin Tarek

mirzafarhanbintarek mfarhan@udel.edu http://mirzafarhan7.github.io/

Summary

I am a dedicated and passionate individual pursuing a Ph.D. in Computer Science at the University of Delaware. My research interests lie at the intersection of machine learning, healthcare, and fairness. I am also interested in implementing my research in a production environment. Currently, I am researching how to mitigate hallucination in clinical large language models. I thrive on challenges and am constantly motivated to expand my knowledge and skill set.

Education

08/2022 – Present **Ph.D. in Computer Science**, University of Delaware, USA

08/2022 – 12/2024 **MS in Computer Science**, University of Delaware, USA

09/2017 – 07/2018 **Individual Modules under Erasmus+ KA1 Mobility Program**, University of Staffordshire, United Kingdom
Thesis title: *Spatio-temporal analysis of large air pollution data.*

02/2014 – 02/2020 **BSc in Computer Science and Engineering**, United International University, Dhaka, Bangladesh

Employment History

08/2022 – Present **Graduate Teaching Assistant,** Department of Computer and Information Sciences, University of Delaware, USA.

- Assist students in undergraduate courses i.e. Machine Organization and Assembly Language (Fall 2022), Introduction to Computer Programming II (Spring 2023), Introduction to Data Mining (Spring 2025). Responsibilities include holding regular office hours, grading exam scripts, and proctoring exams.
- Contributed to the development of the Teaching Assistant Dashboard, used by the department, to streamline and automate processes such as TA offer letter generation, TA assignment, and other functionalities, utilizing HTML, CSS, JavaScript, FastAPI, Jinja2, and Python (Fall 2023, Spring 2024, Fall 2024).

06/2023 – 08/2025 **Instructor (On Contract),** Department of Computer and Information Sciences, University of Delaware, USA.

- As the instructor of CISC181- Introduction to Computer Science II, offered in Summer '23, '24, and '25, I was responsible for giving lectures to students, grading the assessments, and designing and updating the curriculum.

Employment History (continued)

05/2019 – 08/2022

Lecturer, Department of Computer Science and Engineering, Brac University, Dhaka, Bangladesh.

- Instructed and mentored junior and senior year undergraduate students.
- Led a team of faculty members for the *CSE340: Computer Architecture* and the *CSE360: Computer Interfacing* labs, ensuring smooth and efficient coordination.
- Improved the quality of the CSE340 curriculum by modifying it to align with the outcomes-based education (OBE) principles.
- Contributed to the development of the *CSE461: Intro to Robotics* curriculum, ensuring that it met the highest academic standards as well as following the OBE principles.
- Performed administrative tasks as grading and proctoring exams.

Research Publications

1. C. L. Flores, M. F. B. Tarek, J. D. Henderer, R. Beheshti, and R. M. Carroll, "Development of machine learning models and a product predictor to identify patients at risk for diabetic retinopathy in a veteran population," *Investigative Ophthalmology & Visual Science*, vol. 66, no. 8, pp. 339–339, 2025.
2. M. F. B. Tarek, R. Poulain, and R. Beheshti, "Fairness-optimized synthetic ehr generation for arbitrary downstream predictive tasks," in *Accepted at ACM/IEEE International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE '25)*, 2025.
3. R. Poulain, M. F. Bin Tarek, and R. Beheshti, "Improving fairness in ai models on electronic health records: The case for federated learning methods," in *Proceedings of the 2023 ACM Conference on Fairness, Accountability, and Transparency*, ser. FAccT '23, Chicago, IL, USA: Association for Computing Machinery, 2023, pp. 1599–1608, ISBN: 9798400701924. DOI: 10.1145/3593013.3594102.
4. M. F. B. Tarek, M. Asaduzzaman, and M. Patwary, "Spatio-temporal analysis of large air pollution data," in *2018 10th International Conference on Electrical and Computer Engineering (ICECE)*, IEEE, 2018, pp. 221–224.

Skills

Languages	Strong reading, writing, and speaking competencies in English, and native proficiency in Bengali.
Coding	Python, C, Java
Databases	MySQL, Oracle.
Web Dev and Software Engineering	HTML, CSS, FastAPI, Jinja2, Version Control System (Git and GitHub)
Artificial Intelligence and Machine Learning	scikit-learn, PyTorch, prompt engineering in LLMs
Misc.	Academic research, teaching, LaTeX typesetting and publishing.

Projects

2023-2024 **Development of a TA Dashboard For Dept. of CIS, University of Delaware**
As an Infrastructure Teaching Assistant (TA), I worked on developing an application designed to streamline the process of sending offer letters to a diverse group of TAs, while efficiently managing their office hours scheduling, among other functionalities. I developed the back-end functionality using FastAPI and Python to create dynamic features to automate the offer letter generation process based on various criteria. Finally, I also contributed to data processing, form submissions, and database interactions.

Development of Machine Learning Models and a Product Predictor to Identify Patients at Risk for Diabetic Retinopathy in a Veteran Population : In this project, I have developed a machine learning (ML) model to classify patients into low-high-risk categories for DR, allowing personalized screening intervals to optimize resource use and focus on high-risk individuals. During the experiments, I achieved an AUROC score of greater than 0.8 and a high specificity score using Decision Tree, Random Forest, and XGBoost models.

2021 **Skin Cancer Classification with Ensemble of Deep Convolutional Neural Networks**: In this work, deep convolution networks, such as VGG-16, Efficient NetB3, and ResNet-50, were used to identify skin cancer from dermoscopic images.

Awards, Achievements and Certifications

Awards and Achievements

2018 **Summa Cum Laude**, BSc in CSE, United International University, Dhaka, Bangladesh.

2017 **Participated in the Erasmus+ KA1 mobility program (Funded by Erasmus+ EU)** to study for 6 months at the University of Staffordshire, Stoke-on-Trent, the United Kingdom in 2017-2018.

Certifications

2020 **Deep Learning Specialization**. Awarded by Coursera.

2017 **Web development using ASP.NET** . Awarded by CDIP (Centre for Development of IT Professionals), United International University, Dhaka, Bangladesh.

References

Rahmatollah Beheshti, PhD
Associate Professor, University of Delaware
Department of Computer and Information Sciences
Epidemiology Program (Joint)
Data Science Institute
Research Faculty, Nemours Children's Health
302-831-0072 rbi@udel.edu https://sites.udel.edu/rbi/