

MAHEE NOOR TAYBA

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EDUCATION

Baylor University

Master of Science in Computer Science

2023

Waco, Texas

Chittagong University of Engineering and Technology

Bachelor of Science in Computer Science and Engineering

2017

Chittagong, Bangladesh

TEACHING EXPERIENCE

Baylor University

Adjunct Lecturer

August 2023 - Present

Waco, Texas

- Instructor of record for undergraduate computer science courses, including Discrete Structures and Introduction to Computer Systems, with class sizes ranging from 12 to 45 students.
- Designed and delivered lectures, assignments, quizzes, and exams focused on conceptual understanding and problem-solving.
- Developed course materials and assessments aligned with learning objectives and departmental standards.
- Implemented adaptive and student-centered teaching strategies, including in-class practice, formative assessments, and flipped-classroom elements.
- Provided regular office hours, exam reviews, and individualized academic support to promote student success and retention.
- Coordinated with teaching assistants and managed grading and feedback in a timely manner.

Baylor University

Teaching Assistant

January 2022 - May 2023

Waco, Texas

- Served as teaching assistant for Foundations of Computing, Discrete Structures, and Intro to Computer Science I (C++, Python) with Lab.
- Prepared solution sets, graded assignments, and provided constructive written feedback to students.
- Led weekly lab sessions and tutorial sections with programming assignments and conceptual difficulties.

City University

Lecturer

October 2019 - December 2020

Dhaka, Bangladesh

- Served as a full-time lecturer and instructor of record for undergraduate computer science courses with large class sizes (70–90 students).
- Taught courses including Data Structures, Advanced Java, System Analysis and Design, and Numerical Analysis.
- Designed course syllabi, lecture materials, assignments, and exams from scratch.
- Managed all aspects of course delivery, including lecturing, assessment design, grading, and academic advising.
- Supervised undergraduate student projects, including final-year capstone projects.
- Participated in departmental service, curriculum development, and academic committee activities.

The Millennium University

Lecturer

February, 2018 - January, 2019

Dhaka, Bangladesh

- Taught undergraduate courses such as Digital Logic Design, Database Management Systems, and Computer Networks.
- Prepared and delivered lectures emphasizing step-by-step problem solving and applied understanding.

- Supported students through academic advising and mentoring outside the classroom.

RESEARCH EXPERIENCE

Baylor University

Graduate Research Assistant

2021

Waco, Texas

- Predicting different behavioral features using bone marker data of monkeys utilizing machine learning models.
- Dust Aerosol Detection with Ensemble of Machine Learning Models: Investigated dust aerosols using remote sensing techniques and developed tools to analyze dust aerosols at low and high resolutions using modern deep learning techniques.
- Research and ideation development tools on gesture recognition using various sign language data.
- Contributed to writing NSF proposal studying the relationship between a machine learning model's robustness, fairness, and performance.
- Designed and executed independent research studies.
- Presented and discussed papers on machine learning, computer vision, and data science for weekly research labs.

PUBLICATIONS

Enhancing the Resolution of Satellite Imagery Using a Generative Model

<https://ieeexplore.ieee.org/abstract/document/9799082>

- Explored the application of image super-resolution techniques to satellite imagery obtained from NASA Moderate Resolution Imaging Spectroradiometer (MODIS) observation.
- Developed a convolutional neural network (CNN) model, specifically the Super Resolution Generative Adversarial Network (SRGAN), to generate high-resolution images from low-resolution inputs.
- Implemented a perceptual loss function, combining adversarial loss and content loss, to optimize the SRGAN architecture for generating photorealistic and visually appealing super-resolved satellite images.

Unsupervised Machine Learning Methods for Diagnosing Autism Spectrum Disorder Using Multimodal Data: A Survey

<https://ieeexplore.ieee.org/abstract/document/10216749>

- Conducted an in-depth survey and review of research papers focusing on the application of unsupervised machine learning techniques for diagnosing Autism Spectrum Disorder (ASD) using multimodal data.
- Intended to guide future researchers by offering a comprehensive overview of the recent advancements in unsupervised machine learning approaches for diagnosing ASD, ultimately supporting early intervention and improved long-term outcomes for individuals with ASD.

Using Quantum Circuits with Convolutional Neural Network for Pneumonia Detection

<https://rivas.ai/pdfs/tayba2022using.pdf>

- Explored the integration of quantum circuits, a fundamental element of quantum computing, with CNNs to create a highly complex and classically intractable kernel for image classification.
- Proposed a hybrid-CNN model with a CNN-based architecture implemented with a quantum circuit to diagnose pneumonia disease using chest X-ray images.
- Utilized a dataset of over 5,000 chest X-ray images from a public repository, applying both classical and quantum algorithms within the classification context.
- Achieved significant improvements in performance, with higher accuracy values obtained after incorporating the quantum circuit with the classical CNN, demonstrating the efficacy of the proposed quantum convolutional neural network-based model in efficiently categorizing regular and irregular X-ray images for pneumonia detection.

Predicting Traffic Accident Severity with Deep Neural Networks

<https://arxiv.org/abs/2509.03819>

- Conducted research on predicting traffic accident severity using deep neural networks, leveraging recent advancements in machine learning techniques.
- Explored the impact of feature collinearity and employed unsupervised dimensionality reduction techniques, such as autoencoders, to enhance the predictive power of the models.
- Developed a dense neural network model to classify accident severity based on features extracted from traffic accident data.
- Achieved impressive cross-validated results, with up to 92% accuracy in predicting accident severity using the proposed deep neural network approach.
- Contributed to the field of traffic accident analysis by demonstrating the potential of deep neural networks in accurately predicting accident severity and potentially mitigating future risks.

RESEARCH INTEREST

- Human-Computer Interaction
- User Research
- Machine Learning
- Computer Vision

TECHNICAL STRENGTHS

Programming Languages	C, C++, Python, Spring Boot
Databases	MongoDB, PostgreSQL, MySQL
Operating Systems	Windows, Linux
Version Control	Git

PROJECTS

Master's Thesis

- Conducted cross-cultural research on how cultural differences impact information-seeking behavior and the recollection of information on websites.
- Designed and executed user studies involving participants from diverse cultural groups to analyze website navigation patterns and information retention.
- Applied qualitative and quantitative analysis methods to uncover differences in cognitive strategies during online information retrieval.
- Utilized statistical tools to identify significant cultural factors impacting online behavior and recall accuracy.
- Developed insights into culturally adaptive website designs to improve user experience and information accessibility across different demographics by applying Fitts' Law from a user experience standpoint.

Baylor Navigation System

<https://github.com/yudeep-rajbhandari/goBearsBackend>

- A navigation and resource management system for Baylor University that provides easy navigation access to buildings and rooms.
- Implemented the internal navigation system using LeafletJS, providing users with a seamless and interactive map-based interface.
- Utilized Spring Boot framework and Postgres for the backend, allowing for robust data management and efficient communication between frontend and backend components.
- Built the frontend using ReactJS, creating a responsive and intuitive user interface for enhanced user experience.
- Collaborated with a multidisciplinary team, following an agile development approach to ensure timely progress and successful project completion

AR Fishing

- An augmented fishing tool developed the concept of fusing the experience of fishing with augmented reality, which includes annotated texts for classified fish images and real-time location information.

- Researched, ideated, and designed the augmented fishing tool with the objective of reducing overfishing and promoting sustainable fishing practices.
- Research focuses on embedding machine learning with user experience using AR applications.