Deponker Sarker Depto

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Research Interest

My research interests are in computer vision and visual intelligence. I view images, videos, 3D scenes, and multimodal sensor data as different forms of visual evidence, and I aim to design algorithms/ frameworks that can extract meaningful information, reason about complex scenes, and make reliable predictions. Rather than being tied to a single application domain, my broader goal is to develop generalizable visual learning methods for reliable perception and decision-making across real-world environments.

Education

2025-Now | **M.S. in Computer Science** | Chattanooga, TN, USA

- University of Tennessee at Chattanooga

2015-2021 | **B.S. in Computer Science and Engineering** | Dhaka, Bangladesh

- North South University
- Advisor: Dr. Mahdy Rahman Chowdhury
  Thesis: *A High Variant Blood Smear Image Dataset With Comparative Benchmarks of Deep Learning, Machine Learning and Image Processing Techniques*

Research Experience

2025-Now | **Graduate Research Assistant** | Chattanooga, TN, USA

- Center for Urban Informatics and Progress, University of Tennessee at Chattanooga
  * Contribute to industry-funded intelligent transportation projects focused on traffic safety and mobility analysis using real-world intersection camera and LiDAR data, including visualization and surrogate safety measures such as time-to-collision (TTC) and post-encroachment time (PET).
  * Develop and evaluate trajectory forecasting models for vehicles and vulnerable road users, including pedestrians and scooter riders, using real-world urban traffic data to support safety and mobility analysis.

2023-2024 | **Research Mentor** | Dhaka, Bangladesh

- Mahdy Research Academy
  * Supervised and mentored computer vision and medical image analysis research projects for 26 student groups comprising approximately 80 students.
  * Guided students through project ideation, dataset selection and preparation, experimental design, model implementation, result analysis, technical writing, manuscript editing, and journal submission preparation.
  * Mentored several student-led research manuscripts currently under journal review, including submissions to *Energy Reports* and *Biomedical Physics & Engineering Express*.

2021-2024 | **Research Assistant** | Dhaka, Bangladesh

- NSU Optics and Biomedical Lab, North South University
  * Conducted computer vision research in medical image analysis, contributing to problem formulation, custom dataset development and curation, experimental design, model evaluation, manuscript writing, submission, revision, and rebuttal preparation.
  * Published two first-author journal articles on biomedical image segmentation and imbalanced medical image classification in **Q1** and **Q2** journals.

Teaching Experience

2023-2024 | **Instructor** | Dhaka, Bangladesh

- Mahdy Research Academy
  * Delivered live online courses on Python programming and deep learning for registered students, with emphasis on practical implementation for computer vision and medical image analysis projects.
  * Prepared lecture slides, course materials, assignments, grading, and course-completion certificates.

Administrative Experience

2026-Now | **UTC Sports Complex Assistant** | Chattanooga, TN, USA

- University of Tennessee at Chattanooga
  * Coordinated sports facility operations during assigned shifts for student and rental groups, including opening and closing gates, monitoring access and security, preventing unauthorized entry, supporting rentals, maintaining facility assets, tracking hourly occupancy, handling cleanliness, reporting incidents, and providing end-of-shift updates to the supervisor.

2023-2024 | **Program Coordinator** | Dhaka, Bangladesh

- Mahdy Research Academy
  * Managed program operations for student research activities, including student registration, research group allocation, mentor assignment, workload tracking, progress records, financial transaction tracking, and coordination reports to the advisor.

Projects

Few-Shot Segmentation of Retinal Vessels Using Pseudo Annotations

- Designed a pseudo-labeling pipeline for retinal vessel segmentation under limited annotation settings. Trained a U-Net on a small labeled subset to generate pseudo masks for a larger training set, then trained a downstream U-Net using the pseudo annotations and evaluated performance with Dice score and Jaccard index against ground-truth masks.

Experimental Analysis of DDPMs for Medical Image Synthesis

- Implemented and evaluated DDPM-based medical image generators on DermaMNIST using CNN and UNet backbones. Compared noise schedules, diffusion timesteps, learning rates, and time embeddings across controlled runs, using training/validation MSE and qualitative inspection of generated skin-lesion images to analyze model performance and computational trade-offs.

Publication

Journal Articles

2023 J2 **Quantifying imbalance classification methods for leukemia detection**
Deponker Sarker Depto, Md. Mashfiq Rizvee, Aimon Rahman, Hasib Zunair, M. Sohel Rahman, and M. R. C. Mahdy.
Computers in Biology and Medicine
DOI: 10.1016/j.compbiomed.2022.106372

2021 J1 **Automatic segmentation of blood cells from microscopic slides: A comparative analysis**
Deponker Sarker Depto, Shazidur Rahman, Md. Mekayel Hosen, Mst. Shapna Akter, Tamanna Rahman Reme, Aimon Rahman, Hasib Zunair, M. Sohel Rahman, and M. R. C. Mahdy.
Tissue and Cell
DOI: 10.1016/j.tice.2021.101653

Selected Coursework

- Machine Learning; Principles of Data Analytics; Introduction to Statistics; Model Analysis and Simulation.

Awards, Honors, and Competitions

2026 **CECS Student Research Showcase**, 2nd Place, University of Tennessee at Chattanooga
2026 **ACM Spring Programming Contest**, 3rd Place, University of Tennessee at Chattanooga
2026 **UTC Prompt Injection Competition**, 4th Place, University of Tennessee at Chattanooga
2026 **SGA Resilience Scholarship**, University of Tennessee at Chattanooga
2011 **Education Board Scholarship**, Government of Bangladesh, Bangladesh

Presentation

Poster Presentation

- Transportation Research Board Annual Meeting (TRB), Washington, D.C. (2026)
- UTC Spring Research and Arts Conference, Chattanooga, TN (2026)
- Chattanooga Connect, Chattanooga, TN (2025)

Academic Service

Peer Reviewing 5 full papers 2026

- Transportation Research Board Annual Meeting (TRB) (2026)
- IEEE International Conference on Intelligent Transportation Systems (ITSC) (2026)

Skills

Programming	Python, C, C++, Java, JavaScript, R
Machine Learning	Scikit-learn, TensorFlow, PyTorch, OpenCV
Data & Databases	SQL, MySQL, Pandas, NumPy
MLOps & Tools	Docker, Kubernetes, Linux
Visualization	Matplotlib, Seaborn, Plotly
Languages	Bengali (Native), English (Fluent; IELTS 7.5)
Other	Qiskit, Adobe Photoshop, AutoCAD, CorelDRAW, SketchUp, Microsoft Word, PowerPoint, Excel

Leadership

2026	President, International Student Club, University of Tennessee at Chattanooga
2026	Vice President, International Student Leadership Council, University of Tennessee at Chattanooga
2026	Senator, Student Government Association, University of Tennessee at Chattanooga

Volunteering

2026	Feedback Collector, Chattanooga Minority Health Fair
2026	Volunteer, UTC Spring Research and Arts Conference, University of Tennessee at Chattanooga