

Md Nadim Mahmud

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RESEARCH INTERESTS

My primary research interests lie at the intersection of computer vision and generative AI, particularly in developing mobility accessibility solutions and technologies that contribute meaningfully to the scientific advancement of humanity.

EDUCATION

Miami University

M.S. in Computer Science

- GPA: 3.94 / 4.00
- Graduate Assistantship: Full tuition scholarship and living stipend
- Thesis: MyPath: An AI-Powered Accessibility Assistant for Wheelchair Navigation
- Research Interests: LLM, AI, Machine Learning, mmWave Radar, Wheelchair Accessibility

Oxford, OH, USA

Aug. 2024 – May 2026

University of Rajshahi

BSc. in Computer Science & Engineering

- GPA: 3.92 / 4.00

Rajshahi, Bangladesh

Jan 2017 – May 2022

PUBLICATIONS

- [1] S. Karki, E. Han, N. Mahmud, S. Bhunia, J. Femiani, and V. Raychoudhury, “Omniacc: Personalized accessibility assistant using generative ai,” in *AAAI 2025, AI for Urban Planning*, arXiv preprint arXiv:2509.07220, 2025.
- [2] A. M. Hossain, N. Mahmud, E. Han, *et al.*, “A smart and barrier-aware navigation system for wheelchair routing,” in *2025 IEEE 22nd International Conference on Mobile Ad-Hoc and Smart Systems (MASS)*, 2025, pp. 717–722. doi: 10.1109/MASS66014.2025.00117.
- [3] E. Han, N. Mahmud, C. Cordon, *et al.*, “Beyond noisy ground truth: Weakly supervised clip-guided semantic segmentation of accessible sidewalks and crosswalks from satellite images,” in *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, CURRENTLY IN REVIEW, IEEE, 2026.

ACHIEVEMENTS AND PROGRAMMING CONTESTS

- MU Summer Research Fellowship Awardee, Miami University Summer 2025
- Faculty of Engineering Dean’s List, University of Rajshahi Academic Years: 2017, 2018, 2019, 2020
- Ranked 6th in the ITEE FE Bangladesh Exam taken by IPA of Japan Nov 2021
- Passed professional test at Samsung R&D Bangladesh Sept 2022
- Ranked 25th, Nadim_Mahmud, Samsung R&D Bangladesh Coding Contest Sept 2019
- Ranked 74th, RU_Squadron, ICPC Dhaka regional contest 2019

RESEARCH EXPERIENCE

Graduate Assistant

Miami University

Aug. 2024 – May 2026

Oxford, OH

- Accessible routing, Navigation path generation, Zero-shot learning, mmWave-based feature detection
- Designing and fine-tuning LLM to build an AI assistant for wheelchair users to generate optimal accessible routes
- Applied zero-shot learning using the OpenAI API for recognizing sidewalks as accessibility features
- Working with mmWave radar-based methods for road feature detection
- Contributed to the preparation of NIH R15 grant writing
- Mentored a group of four undergraduate students on their capstone project
- Assisted in the review process of three research paper submissions

Undergraduate Researcher

University of Rajshahi

Aug 2021 – May 2022

Rajshahi, Bangladesh

- **Thesis:** A Machine Learning Approach for Differentiating Resting State Neural Activity in Autism Spectrum Disorder (ASD) from Control using rs-fMRI
- Research on fMRI images of different Autism Spectrum Disorder patients & find out the correlation among the resting state brain function of different regions of interest
- Implemented data pre-processing script for ROI-extraction, correlation & union of voxels of each ROI

EMPLOYMENT

Software Engineer

Therap Bd Ltd. (Multinational)

Oct 2022 – July 2024

Dhaka, Bangladesh

- **Tech Stack:** Java Spring Framework, Hibernate, Oracle SQL, JSP, JavaScript, jQuery
- Played a key role in developing a scalable push notification framework, with a 300,000+ user base
- Developed Excel upload/download solutions using internal frameworks, improving data entry efficiency by 80%
- Implemented advanced archive and search functionality with internal frameworks
- Developed database migration scripts
- Conducted thorough code reviews, ensuring quality and best practices

LEADERSHIP AND UNIVERSITY ENGAGEMENTS

Graduate Teaching Assistant

Miami University

Oct 2024 – Present

Oxford, OH

- Mentoring students in their Software Engineering projects, helping with design and implementation
- Mentoring projects for the course Intro to AI

Member of Faculty Learning Center - AI & Student Project Development

Miami University

Fall 2025 – Spring 2026

Oxford, OH

- Exploring and evaluating AI tools (e.g., ChatGPT, Grammarly) for academic writing
- Will develop guidelines and AI-integrated lesson plans, collaborating on departmental recommendations and alternative assessment strategies to support responsible AI use in coursework.

Capstone Project Mentor

Miami University

Fall 2025 – Spring 2026

Oxford, OH

- Mentoring 4 undergraduate students on their capstone research project for blind people navigation

Programming Club Trainer

University of Rajshahi

Jan 2018 – Nov 2021

Rajshahi, Bangladesh

- Conducted 100+ Algorithm and Data Structure sessions
- Organized 20+ programming contests

PROJECTS

MyPath – Wheelchair-Accessible Routing App | JavaSpring, Hibernate, PostgreSQL

Dec 2024 – Present

- Developed a Java Spring Boot API to generate wheelchair-accessible routes based on latitude-longitude queries
- Returns routes with surface type, incline, turns, and duration for optimized accessibility

Deep Learning-Based Learned Skeletonization of Road Networks | CNN

April 2025 – Present

- Developed a deep learning model to recover thin road skeletons from thick, noisy OpenStreetMap (OSM) images
- Training a custom U-Net with weighted focal loss and residual blocks, achieving high accuracy on distorted, rasterized road data

Multivendor E-Commerce | JavaSpring, PostgreSQL, Hibernate

Jan 2023 – April 2023

- Website Implemented user and product management, shopping cart functionality, and order processing.
- Utilized Java, Spring, PostgreSQL, Hibernate, and JSP with role-based authentication (Admin, User, Shopkeeper, Deliveryman).
- Automated project build and deployment using Gradle and Docker.

RU Contacts App (10000+ downloads) | Kotlin, MVVM

April 2022 – June 2022

- Developed a contacts app for Rajshahi University using Android Studio and Kotlin
- Implemented MVVM architecture for better maintainability and scalability

TECHNICAL SKILLS

Languages Java Spring, Hibernate, JSP, MySQL, Oracle SQL

Frameworks: React, Node.js, Flask, JUnit, WordPress, Material-UI, FastAPI

Developer Tools: Git, Docker, VS Code, IntelliJ

Libraries: pandas, NumPy, Matplotlib