Md Nadim Mahmud

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Education

M.S. in Computer Science   Aug 2024 – Present
Miami University, *Oxford, OH, USA*   Anticipated Graduation: May 2026
GPA: 3.92
Thesis: MyPath: An AI-Powered Accessibility Assistant for Wheelchair Navigation

BSc. Engg. in Computer Science & Engineering   Jan 2017 – May 2022
University of Rajshahi, *Rajshahi, Bangladesh*
GPA: 3.92 (Top of my class)

Publications

- **OmniAcc: Personalized Accessibility Assistant Using Generative AI**   AAAI 2025
  Workshop on AI for Urban Planning, AAAI 2025

- **A Smart and Barrier-Aware Navigation System for Wheelchair Routing**   IEEE MASS 2025
  Seventh International Workshop on Smart Living with IoT, Cloud and Edge Computing (SLICE 2025), MASS 2025

Employment

Therap Bd Ltd. (Multinational), *Dhaka, Bangladesh* | Company Website   Oct 2022 – July 2024
Software Engineer
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

Research Experience

Graduate Assistant   Aug 2024 – Present
Miami University, *Oxford, OH, USA*
- **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 and localization in built environments
  - Exploring mmWave and camera data for improved pose estimation and activity recognition.

Undergraduate Researcher   Aug 2021 – 2022
University of Rajshahi, Rajshahi, Bangladesh
- **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

Projects

MyPath – Wheelchair-Accessible Routing App | Project Website   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 | Project Link   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

Zero-Shot Crosswalk Detection from GeoTIFF and GIS Data using GPT-4o | Paper Link   Nov 2024 – Dec 2024
- Processed GeoTIFF satellite images and OpenStreetMap (OSM) data for analysis
- Applied zero-shot learning with GPT-4o to detect crosswalks from high-resolution GIS imagery without labeled training data, achieving 97.5% accuracy

Urban Sprawl Detection (GIS) | Project Link   Nov 2024 – Dec 2024
- Analyzed urban sprawl in Dhaka using remote sensing and GIS with USGS data
- Computed and visualized NDBI, SAVI, MNDWI, and IBI indices for land use assessment

Multivendor E-Commerce Site | Project Link   Jan 2023 – April 2023
- 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) | PlayStore Link   April 2022 – June 2022
- Developed a contacts app for Rajshahi University using Android Studio and Kotlin
- Implemented MVVM architecture for better maintainability and scalability

Leadership and University Engagements

- **Graduate Teaching Assistant**, Miami University, *Oxford, OH*   Aug 2024 – Present
  - Mentoring students in their Software Engineering projects, helping with design and implementation

- **Member of Faculty Learning Center - AI & Student Project Development** , Miami University, *Oxford, OH*   2025 - 2026
  - 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.

- Mentored 2 undergraduate students on the MyPath routing research project, Miami University, *Oxford, OH*   2024 - 2025

- **Programming Club Trainer**, University of Rajshahi, *Rajshahi, Bangladesh*   Jan 2018 – Nov 2021
  - Conducted 100+ Algorithm and Data Structure sessions
  - Organized 20+ programming contests

Achievements and Programming Contests

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

Language and Technologies

- **Programming Languages:** C, C++, Java, Python, JavaScript, Matlab
- **Tech-Stack:** Java Spring, Hibernate, JSP, MySQL, Oracle SQL
- **Version Control:** Git, GitHub, Bitbucket

References

- **Vaskar Raychoudhury, Ph.D**
  Associate Professor
  Department of Computer Science and Software Engineering, Miami University, OH, USA
  email: raychov@miamioh.edu
- **Md. Khademul Islam Molla, PhD**
  Professor
  Computer Science & Engineering, University of Rajshahi, Bangladesh
  email: khademul.cse@ru.ac.bd