Ekhfa Hossain

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Education

BS in Computer Science & Engineering   **Summer 2017 – Summer 2021**
North South University   *Dhaka, Bangladesh*
Honor: ***Magna Cum Laude*** (CGPA: 3.72/4.00)

Work Experience

Software Engineer   **April 2024 – Present**
Sazim Tech Ltd   *Dhaka, Bangladesh*

- Developing scalable applications using NextJs, TypeScript, and NestJS, ensuring high performance and robust architecture.
- Collaborating with cross-functional teams to deliver high-quality production-ready features on time, ensuring seamless integration and meeting project objectives.
- Integrating advanced testing frameworks and CI/CD pipelines to uphold code quality standards and streamline the software delivery process.

Trainee Software Engineer   **October 2023 – March 2024**
Sazim Tech Ltd   *Dhaka, Bangladesh*

- Led the development of a secure blockchain-based voting application using MetaMask, Next.js, and Ethereum smart contracts.
- Built an e-commerce platform with Next.js, TypeScript, Tailwind CSS, and Express.js, featuring real-time updates via Socket.IO
- Managed a large-scale project, demonstrating industry best practices and teamwork, and delivered a production-ready product.

Undergraduate Teaching Assistant   **August 2021 – January 2022**
Department of Mathematics and Physics   *North South University*   *Dhaka, Bangladesh*

- Assisted faculty members with course-related tasks, demonstrating a solid understanding of the subject matter.
- Managed a total of 200 students: Two sections for MAT116 (Pre-Calculus) and Three sections for MAT120 (Calculus-I), each with 40 students.
- Proctored exams and quizzes, evaluated exam papers and quizzes, and held both in-person and virtual office hours.
- Collaborated with faculty to enhance the effectiveness of course materials and support the learning objectives.

Research Experience

Undergraduate Directed Research   **February 2021 – November 2021**
Department of Electrical and Computer Engineering   *North South University*   *Dhaka, Bangladesh*

- Led an initiative in a broader effort to combat online harassment and hate speech in low-resource languages.
- Implemented a machine-learning system to analyze and classify social media comments in Bangla, focusing on sentiment analysis and identifying hate speech and cyberbullying.
- Created a meticulously annotated dataset of eleven thousand Bangla comments and corresponding reactions, ensuring high annotation accuracy through rigorous quality assurance using both manual and statistical methods, validated with a Cohen's Kappa statistic.
- Conducted insightful demographic analysis to identify patterns in individuals contributing to hate speech and cyberbullying on social media platforms.

Senior Design Project   **October 2020 – May 2021**
Department of Electrical and Computer Engineering   North South University   Dhaka, Bangladesh

- Developed a real-time traffic offense detection system using YOLOv4 and OpenCV DNN, with a multi-stage pipeline for vehicle detection, classification, and tracking
- Combined, pre-processed, and labeled datasets from multiple sources, comprising 11,210 images with 46,662 labeled objects across 17 vehicle categories. An additional dataset of 1,266 labeled images was used for helmet detection.
- Achieved high accuracy in vehicle detection and classification, with mean average precision rates of 87.19% for YOLOv4 and 98.1% for YOLOv4-tiny in detecting helmets.

Publications

F. H. Shubho, F. Iftekhar, **E. Hossain** and S. Siddique, "*Real-time traffic monitoring and traffic offense detection using YOLOv4 and OpenCV DNN*," TENCON 2021 - 2021 IEEE Region 10 Conference (TENCON), 2021, pp. 46-51
DOI: *10.1109/TENCON54134.2021.9707406*

S. A. Kaiser, S. Mandal, A. K. Abid, **E. Hossain**, F. B. Ali, and I. T. Naheen, "*Social Media Opinion Mining Based on Bangla Public Post of Facebook,*" 2021 24th International Conference on Computer and Information Technology (ICCIT), 2021, pp. 1-6
DOI: *10.1109/ICCIT54785.2021.9689860*

Skills

Programming Language	C, C++, Python, Java, JavaScript, Solidity, TypeScript
Machine Learning	Google Colab, TensorFlow, Scikit-learn
Web Programming	ReactJS, NodeJS, NextJs, NestJs, ExpressJs
Database	MySQL, PostgreSQL, Firebase, IPFS
Mobile Programming	Android
Version Control System	Git, GitHub
Documentation	LaTeX, Overleaf
Office Suite	Microsoft Word, Excel, PowerPoint

Honors and Awards

- ❖ Merit-based Scholarship from North South University (50% Tuition Waiver)   **2017 – 2021**

Presentations

Real-time traffic monitoring and traffic offense detection using YOLOv4 and OpenCV DNN   **2021**
Poster presentation at North South University Capstone Design Project Day 2021

Extracurriculars

NSU Problem Solvers   **2018 – 2020**

- Ranked in the top 20 out of 100+ peers, earning selection for NSUPS Bootcamp training in competitive programming.
- Received training in Number Theory, Dynamic Programming, and Data Structures and honed problem-solving skills through weekly programming contests.

NSU ACM W Student Chapter   **2017 – 2020**

- Promoted diversity in tech by leading workshops and free classes in software development and web security for female students.
- Organized flagship event, "Inter-University Girls' Programming Contest (IUGPC 2019)," drawing participation from 80 national teams and captivating nationwide interest among female contestants.