MEHEDI HASAN

📞 (+880)196-950-0278   ✉ mhasan912@gmail.com   in linkedin.com/in/moidda   ⓞ https://github.com/Moidda   🌐 https://moidda.github.io
ⓢ Scholar

RESEARCH INTEREST

I am a **Software Engineer** specializing in Research at Chaldal. Outside of work, I am involved in academic research. My primary area of interest is **Human Computer Interaction**. I'm also passionate about **Visualization**, **VR/AR**, and **Ubiquitous** technologies. Through my work experience, I've gained expertise and interest in **Algorithms** and **Systems**, including **Networking**, **Distributed Systems** and **System Design**.

EDUCATION

BSc in Computer Science and Engineering   **May 2023**

Bangladesh University of Engineering and Technology (BUET), *Dhaka, Bangladesh*

Notable Courses:

CSE 305 - Computer Architecture	CSE 309 - Compiler
CSE 321 - Computer Networks	CSE 463 - Introduction to Bioinformatics
CSE 471 - Machine Learning	CSE 409 - Computer Graphics
CSE 461 - Algorithm Engineering	MATH 247 - Linear Algebra
CSE 313 - Operating System	MATH 145 - Calculus and Coordinate Geometry
CSE 405 - Computer Security	HUM 477 - Sociology for Science and Technology

ENGLISH PROFICIENCY

TOEFL iBT   **December, 2023**

Reading: 25, Listening: 28, Speaking: 30, Writing: 29   *Total: 112*

PUBLICATIONS

– Mubassira, T., **Hasan, M.**, Sharmin, S. (2024). **"Reading the Mind's Eye: Detecting Trauma-Vulnerability in Individuals by Analyzing Attention Through Eye-Tracking"**. In: Zaslavsky, A., Ning, Z., Kalogeraki, V., Georgakopoulos, D., Chrysanthis, P.K. (eds) Mobile and Ubiquitous Systems: Computing, Networking and Services. MobiQuitous 2023 (EAI Mobiquitous 2023). DOI: 10.1007/978-3-031-63992-0_28

– Mubassira, T., **Hasan, M.**, Mukta, J., Islam, A (2024). **"Enhancing EmoBot: An In-Depth Analysis of User Expectation and Satisfaction in An Emotion-Aware Chatbot"**. In: International Conference on Networking, Systems and Security, 2024.

RESEARCH EXPERIENCE

Detecting Sentiment in Anonymous Submissions: A Study on User Report Data

Human Computer Analysis, Sentiment Analysis   *Sep 2024 - Current*

– **Supervisor:** Dr. A. B. M. Alim Al Islam, Professor, CSE, BUET
– **Contribution:** Performed sentiment analysis on crowd sourced anonymous reports

Towards perceiving and resolving the impediments to reporting for the developing countries

Human Computer Interaction, Generic Reporting System   *Aug 2024 - Current*

– **DOI:** 10.1109/NSYSS2.2017.8267790
– **Live At:** ureporter.cse.buet.ac.bd
– **Supervisor:** Dr. A. B. M. Alim Al Islam, Professor, CSE, BUET
– **Collaboration:** With Tarik Reza Toha, University of North Carolina at Chapel Hill
– **Contribution:** Improved the system in collaboration with the research team

Fine-Tuning GPT-2 for Bengali Auto Text Completion Using Literary Corpus: A Qualitative Analysis

Natural Language Processing, Machine Learning   *Jan 2023 - Mar 2023*

– **Presentation:** Slides
– **Supervisor:** Dr. Mohammed Eunus Ali, Professor, CSE, BUET
– **Contribution:** Fine-tuned GPT-2 with a Bengali literature corpus to improve auto text completion

INDUSTRY EXPERIENCE

Chaldal Ltd. June 2023 – Present
R&D

ASAP Delivery
– Designed an algorithm to **calculate geographical area overlapping a route**, through which a driver can detour for a specific slack time period to deliver to a new location without impacting other deliveries in the route
– **Impact:** Grocery delivery within 20 to 40 minutes in Dhaka

Last Mile Routing Algorithm
– Designed a new **routing algorithm** using different heuristic and probabilistic search methods
– **Impact:** Increased on-time delivery by 15%

Traffic Estimate
– Developed a **timeseries database** and supervised an interpolation project using **spatio-temporal models** to fill missing traffic speed data.
– **Impact:** Improved estimates for Dhaka roads by 53.53% for cycles, 28.83% for motorbikes, and 28.73% for vans

Automate Task Assignment
– Designed and deployed an algorithm for solving the **task assignment problem** via an API endpoint, integrated into a system for periodic task assignment within the warehouse.
– **Impact:** Increased on-time dispatch by 16%

System Design

Micro-services communication
– Designed and implemented a **gRPC-based communication system** across three services to transmit information at specific events, tested it in a QA environment, and oversaw its system-wide deployment.
– **Impact:** Decreased driver idle time by 7 minutes

Spatial Database Model
– Developed a **spatial database model** which can store polygonal area and query with intersecting geolocation
– **Impact:** Enhanced vehicle utilization by restricting certain vehicle types in specific areas

Re-Modeling Task Assignment system
– Designed a more efficient task assignment model, refactored existing models, redesigned the UI, and improved underlying logic.
– **Impact:** Increased picker's efficiency by 1.2x

CONFERENCES AND TALKS

EAI MobiQuitous 2023 - 20th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services 14-17 November, 2023
RMIT University, Melbourne, Australia
Presented our research work at the time alongside my co-author

NSysS 2023 - 10th International Conference on Networking, Systems and Security 21-23 December, 2023
BUET, Dhaka, Bangladesh
Presented our paper accepted in the conference alongside my co-author

How BUET Alumni Help Build Infrastructure of Bangladesh through Software 05 March, 2024
BUET, Dhaka, Bangladesh
Discussed my work, its impact on Bangladesh's infrastructure, and how it differs from a traditional software engineering role.

EXTRACURRICULAR ACTIVITIES AND LEADERSHIP

BUET CSE Fest AI Contest 15-23 July, 2022
Lead Organizer
Actively managed, set problem and judged the submissions of AI contest that had over 100 participants, hosted in codingame.com

Achievements and Awards

2022	$5^{th}/50$	Code Samurai Hackathon
2021		Hackerrank: Problem Solving (Intermediate)
2020		Codeforces Max Rating: Expert (1871)
2019	$8^{th}/86$	BUET CSE FEST IUPC
2019	$10^{th}/84$	DUET IUPC
2019	$13^{th}/59$	NSU Cybernauts National Programming Contest
2019	$13^{th}/96$	RUET IUPC
2019	$14^{th}/84$	IUT IUPC
2019	$18^{th}/109$	SUB IUPC
2019	$34^{th}/119$	SUST IUPC
2016	$2^{nd}/100$	Laboratorians Festival Math Olympiad
2015	$8^{th}/1000$	Regional Math Olympiad
2014	$2^{nd}/500$	National Astronomy & Astrophysics Olympiad

Selected Projects

Trapped (Game)
Unity Game Engine, C#
Developed a 2D action and puzzle platformer

Codingame: Steal The Flag
Java
Developed and hosted a game on codingame.com

P5js-Raycasting
Javascript, HTML
Implemented raycasting using p5-js library for visualization

xv6 Memory Management (OS)
Linux, C, bash, kernel programming
Enhanced the xv6 operating system by adding support for memory management.

Simple C Compiler
C, YACC, Bison
Developed a C compiler capable of reading small C programs and generating corresponding machine code for execution.

CNN from Scratch
Python
A simple implementation of a convolutional neural network using Python and NumPy, trained on the NumtaDB dataset to recognize Bengali digits.

Chaldaal (Web App)
django/python, oracle/sql, HTML/CSS, JS
Created an online grocery shop similar to chaldal.com

Smart Construction Work System (Web App)
Django, SQLite, HTML/CSS, JS
Developed a citywide smart construction management system

References

Dr. Sadia Sharmin
Associate Professor
Department of Computer Science and Engineering
Bangladesh University of Engineering and Technology
Email: sadiasharmin@cse.buet.ac.bd,
sadia@teacher.cse.buet.ac.bd
Contact: +880 1817 108555

Dr. Mohammed Eunus Ali
Professor
Department of Computer Science and Engineering
Bangladesh University of Engineering and Technology
Email: eunus@cse.buet.ac.bd
Contact: +880 2 9665612

Dr. A. B. M. Alim Al Islam
Professor
Department of Computer Science and Engineering
Bangladesh University of Engineering and Technology
Email: alim_razi@cse.buet.ac.bd
Contact: +880 1817 533953