

MD. Jawadul Hasan

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RESEARCH INTERESTS

Large Language Models, DevOps Automation, and AI-augmented Software Engineering, with an emphasis on intelligent code generation, transformation, and ensuring robust, secure software systems.

EDUCATION

American International University - Bangladesh

September 2023

BSc. in Computer Science and Engineering (CSE)

Cumulative GPA: 3.99/4.00

- Relevant coursework: Algorithms & Data structures, OOP, Database, Networks, Web technologies, Data mining, Advanced programming with Java & Dot Net, Software Quality & Testing, Artificial Intelligence

PROFESSIONAL EXPERIENCE

Software Engineer

July 2023 – Present

Brain Station 23 PLC

Dhaka, Bangladesh

- Designed high-throughput concurrent processing systems with transaction isolation mechanisms, processing 10,000+ daily transactions while maintaining data consistency constraints
- Developed distributed payment infrastructure utilizing bank API integrations, reducing transaction latency through parallel processing methodologies
- Engineered real-time data streaming architecture using WebSocket protocols (SignalR), enabling immediate data propagation for analytical processing
- Applied NoSQL database structures (MongoDB) with in-memory caching (Redis) to optimize geospatial data query performance
- Constructed event-driven architecture using message queuing systems (RabbitMQ), implementing asynchronous communication patterns
- Executed migration of legacy relational data spanning 15 years, applying normalization techniques to enhance analytical query capabilities
- Established automated CI/CD pipelines (Jenkins) for Windows Server environments, creating reproducible build processes and systematic deployment methods
- Implemented systematic code refactoring methodologies with test-driven development approaches, reducing system defect rates
- Contributed to an insurance project focused on predictive analytics, developing models to forecast tentative claims and estimate claim amounts for improved risk assessment and decision-making
- Created multi-level approval systems with optimized database stored procedures, utilizing complex transaction flows
- Developed unit tests and refactored code to improve testability and eliminate code smells.
- Mentored and trained junior engineers in software engineering best practices and problem solving, fostering a culture of technical excellence and preparing them for complex engineering challenges.

Research Assistant

Dec 2024 – Present

ELITE Lab

NY, USA

- Pursuing applied research and development focused on large language models (LLMs) & conversational AI for domain-specific applications.
- Building AdmissionGPT, a context-aware assistant designed to answer university admission queries with high relevance and accuracy.

RESEARCH PUBLICATIONS

Enhanced Classification of Anxiety, Depression, and Stress Levels: A Comparative Analysis of DASS21 Questionnaire Data Augmentation and Classification Algorithms

Accepted, 3rd International Conference on Computing Advancements (ICCA 2024)

Authors: Md Jawadul Hasan, Aritra Das, Joy Matubber, Shadril Hassan Shifat, Md. Kishor Morol

This undergraduate thesis investigates the use of machine learning techniques to classify the severity of anxiety, depression, and stress in university students, based on their responses to the DASS-21 questionnaire. The study explores data augmentation and compares various classification algorithms to understand their effectiveness in mental health prediction.

TECHNICAL SKILLS

Skills: Problem Solving, Algorithms & Data Structures, OOP, Agile, Scrum

Programming: C# , C++, SQL, Java, Python, JavaScript

Frameworks & Libraries: Dot Net, Dot Net Core, EF Core, xUnit, Angular, Vue, NextJs, Fast API

Database: MSSQL, MongoDB, PostgreSQL, Redis, Pinecone

Architecture & Design: Clean, Monolith, Microservice, Vertical Slice, MVC, REST, CQRS, Solid, DRY, YAGNI

DevOps & Tools: Git, GitHub, CI/CD, Jenkins, Docker, IIS, Figma, Azure Repos, Amazon S3, Open AI, Jira

RESEARCH & DEVELOPMENT PROJECTS

Intent Based Search – Advanced Information Retrieval System

Mar 2025 - Present

- Developed a sophisticated search system that interprets user intent using language models to enhance query understanding
- Fine-tuned the Hugging Face MiniLM model using a custom synthetic dataset specifically created for optimizing query paraphrasing
- Engineered a metadata extraction pipeline that processes user queries, generates embeddings, and performs vector similarity matching
- Implemented a hybrid architecture combining language models with Pinecone vector database for semantic search and MongoDB for storing corpus data

AdmissionGPT – AI Chatbot for University Admission Queries

Jan 2025 - Present

- Developing a conversational AI application to assist university admission aspirants with accurate, real-time answers to frequently asked questions
- Integrating a fine-tuned GPT model to provide context-aware responses tailored to admission processes, university programs, deadlines, and eligibility
- Implementing a sliding window mechanism to allocate a specific number of tokens over a defined time period, with restrictions applied once the quota is reached
- Maintaining subscription packages to manage token usage and ensure fair access for users with varying levels of access

Centralized Jenkins CI/CD Pipeline Implementation

Apr 2025 - Present

- Designing and implementing a centralized Jenkins server managing CI/CD pipelines for multiple cross-platform projects
- Integrating automated build processes with Git repositories for continuous code integration and deployment
- Developing AI-powered pipeline optimization that analyzes build patterns, suggests Jenkinsfile improvements, and automates deployment script enhancements

ACADEMIC PROJECTS

- **EkSheba - Integrated E-Government Services Platform** Fall 2022
Web Application Development Project [Project Link]
 - Developed a comprehensive e-government portal with banking, passport, tax, and job application services
 - Implemented secure user authentication with token-based validation and role-based access control
 - **Tools & Technology:** ASP.NET Core, REST API, MSSQL, Entity Framework
- **Brain Stroke Prediction System using Machine Learning** Summer 2022
Machine Learning Course Project [Project Link]
 - Developed classification models using Naive Bayes, Decision Tree and KNN algorithms
 - Achieved 95% prediction accuracy using WEKA tool for early stroke risk assessment
 - **Tools & Technology:** WEKA, Cross-validation, Data Preprocessing
- **HealthPlus - Centralized Healthcare Information System** Spring 2022
Healthcare Informatics Project [Project Link]
 - Developed a platform for centralizing citizens health records while providing integrated healthcare services
 - Implemented features for medical history storage, appointment booking, emergency services, and blood donation network
 - **Tools & Technology:** PHP, MySQL, HTML, CSS, JavaScript, Selenium (for automated testing)
- **Padma Multipurpose Bridge Simulation** Fall 2021
Computer Graphics Project [Project Link]
 - Developed an interactive graphical simulation depicting the historical significance of Bangladesh's Padma Bridge
 - Implemented multiple animated scenarios showing pre-bridge transportation challenges, construction phase, and post-construction benefits
 - **Tools & Technology:** C++, OpenGL, GLUT

ACHIEVEMENTS

- Top 1% in class; received Summa Cum Laude for an exceptional CGPA
- Selected for the Dean's List honors for outstanding academic performance
- Ranked 6th in the Intra AIUB Programming Contest Fall 2021-22
- Solved over 600+ algorithmic challenges on LeetCode, Codeforces, HackerRank etc
- Finalist on a app development competition hosted by IEEE India in 2020
- Ranked 13th in CTO Forum Hackathon idea round among 124 Teams