Tanzim Hossain Romel

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Experience

Software Development Engineer 1, IQVIA – Dhaka, Bangladesh June 2023 – Present

- Backend Engineer at KPI Library team developing microservices-based healthcare applications handling millions of patient records using .NET Core and C#
- Architected cloud-native applications on AWS (Lambda, EC2, S3, DynamoDB) and designed RESTful APIs following industry best practices for global pharmaceutical clients
- Integrated LLM capabilities into clinical data analytics dashboards, enabling natural language querying and automated report generation with 85% reduction in manual processing time
- **Performance Optimization Leadership:** Achieved 60% reduction in complex query execution times through comprehensive database optimization including query plan analysis, strategic indexing, and materialized views implementation
- Implemented advanced caching strategies with Redis and MongoDB optimization techniques, delivering 40% improvement in API response times across healthcare data pipelines
- Built interactive Angular visualization dashboards reducing data interpretation time by 30% and improving client engagement by 45%
- Implemented comprehensive testing (72% to 95% coverage), CI/CD pipelines (99.9% uptime), zero-downtime deployments, and distributed tracing with Jaeger reducing troubleshooting time by 50%
- Led proof-of-concept projects, mentored junior developers, and collaborated with cross-functional teams across multiple time zones
- Received IQVIA Impact Program – Silver award (May 2025) for outstanding performance and essential feature development
- Technologies: C#, .NET Core, PostgreSQL, MongoDB, AWS, Docker, Kubernetes, Jaeger, OpenTelemetry, GitLab CI, Angular, Redis

Education

Bangladesh University of Engineering and Technology April 2018 – May 2023
B.Sc in Computer Science and Engineering

- GPA: 3.53/4.0 (3.61 in the final term) | 3.86/4.0 in sessional courses (lab practicals and group projects), demonstrating strong implementation and teamwork skills
- Notable Courses: Machine Learning, High Performance Database Systems, Fault Tolerant Systems, Data Structure and Algorithms, Operating Systems, Computer Security

Research

Extending LLM API Contract Analysis: A Refined Taxonomy and Empirical Study Nov 2024 - Present

- Research collaboration with Dr. Akond Rahman, Assistant Professor at Auburn University, specializing in DevOps and cybersecurity
- Developed extended taxonomy for API contracts in LLM libraries integrating classical and novel LLM-specific categories
- Conducted empirical study analyzing 412 real-world issues from Stack Overflow, GitHub, and developer forums covering LangChain, HuggingFace, and LlamaIndex
- Pioneered LLM-based approach for automated contract extraction and proposed actionable recommendations for library developers
- Currently extending the research by developing Design by Contract (DbC) tools to automatically enforce and validate LLM API contracts in production systems

Blockchain in Healthcare 2.0 – A Comprehensive Scalable and Privacy-Preserving Health Data Management System June 2022 – May 2023

- Undergraduate thesis supervised by Professor ASM Latiful Hoque from BUET, specializing in data warehousing

and big data analytics

- Engineered advanced blockchain framework with sharding, Layer-2 solutions, and DAG ledger for millions of healthcare records
- Implemented patient-centric consent management with smart contracts, HL7 FHIR standards, and privacy-preserving computation
- Built fault-tolerant microservice architecture with hybrid storage and next-generation security features including post-quantum cryptography

Projects

URL Shortener Nov 2024 - Present

- Designed and developed a production-ready URL shortener system that incorporates best practices for back-end and front-end development using.NET, React.js, and Azure services.
- Implemented features such as CI/CD with GitHub Actions, infrastructure as code using Azure Bicep, secrets management with Azure Key Vault, and authentication with Microsoft Entra ID.
- Optimized performance with Azure Redis Cache and CosmosDB, ensured scalability with Azure Front Door and PostgreSQL, and enhanced telemetry with OpenTelemetry and Application Insights.

Image caption generation using enhanced Show, Attend, and Tell with BERT Context Vectors Jan 2023 – Feb 2023

- Extended the "Show, Attend, and Tell" image captioning model by adding BERT, improving both the quality and speed of image captions.
- Used BERT's language features to make captions more accurate and context-aware.
- Reduced training time by leveraging BERT's pre-trained knowledge, allowing faster model convergence without losing accuracy.
- Showed how to combine advanced language understanding with image captioning to push the limits of AI-based image analysis.

Eventfly: An End-to-end Event Management System May 2022 - July 2022

- Designed and developed a comprehensive microservices-based system to streamline event organization and participation.
- Led the back-end architecture and implemented key services, including newsfeed, payment, authentication, and event management.
- Tools Used: TypeScript, Express.js, Next.js, Docker, Kubernetes, NATS, and MongoDB.

Publications

An Unconventional Tale on Sentiment Analysis over Anonymous Online Reporting by the People in Bangladesh during an Outburst Period Sep 2024 - Nov 2024

The 28th ACM Conference on Computer-Supported Cooperative Work and Social Computing (In review)

- Developed *uReporter* – Bangladesh's first anonymous online reporting system that became critical during the 2024 national crisis.
- Analyzed 124 crowd-sourced reports using six transformer models (RoBERTa, DistilBERT, XLM-EMO) and NRC Lexicon-based analysis.
- Technical Contributions:
  - Multilingual NLP pipeline for Bengali/Romanized Bengali using GPT-4 translations.
  - Comparative framework for emotion detection model evaluation.
  - Temporal emotion visualization system for outburst monitoring.
- Implications for CSCW: Demonstrates anonymous crowd-sourcing's potential for understanding Global South socio-political dynamics.

Achievements & Awards

- **IQVIA Impact Program – Silver Award** (May 2025) – Received at IQVIA for demonstrating outstanding performance by completing numerous tasks, resolving critical issues, supporting team processes, and developing essential features that significantly improved the product. [Certificate]

- **Finalist, Blockchain Olympiad Bangladesh 2021** (April 2021) – Selected as one of the 40 finalists among numerous teams from across the country with our project "Blockchain Based Ticketing Platform". Participated as part of the "Recursively Enumerable" team alongside Ataf Fazledin Ahamed and Md. Tanzim Azad Nishan from BUET.
- Secured **2nd place** out of 120 participants with an accuracy of 95.9% in the Bangla Handwritten Digits Recognition contest in CSE 472 Machine Learning Lab at BUET (November 2022). Developed custom CNN architecture implemented from scratch using only NumPy and OpenCV.
- **Dean's List Award** – Awarded for outstanding academic results in Level-2 of BUET.
- **Bangladesh Physics Olympiad (BdPhO)** National prize winner (2017)
- **Bangladesh Chemistry Olympiad** National prize winner (2017)
- **Talentpool HSC Scholarship** Received from Rajshahi Education Board in 2017 with 95.6% marks in science, placing 15th in Rajshahi Board.

Tools & Technologies

- **Programming Languages:** C#, .NET, Python, JavaScript, Go
- **Machine Learning:** PyTorch, NumPy, Pandas, OpenAI API, LangChain
- **Blockchain:** Ethereum, Solidity, Hyperledger Fabric
- **Web & Backend Frameworks:** ASP.NET, Express.js, FastAPI
- **Databases:** PostgreSQL, MongoDB, Microsoft SQL Server
- **DevOps & Cloud:** Docker, Kubernetes, Azure, AWS, GitHub Actions
- **Monitoring & Observability:** OpenTelemetry, Jaeger
- **Other:** Redis, gRPC, Entity Framework, Azure Bicep

Test Scores

- **TOEFL iBT**: 103/120 (Listening: 29, Reading: 29, Writing: 22, Speaking: 23)