

# Tanzim Hossain Romel

Uttara, Dhaka, Bangladesh | romel.rcs@gmail.com | +88 01771 600158 | linkedin.com/in/thromel  
github.com/thromel | tanzimhromel.com

## Education

**Bangladesh University of Engineering and Technology (BUET) – Dhaka,** April 2018 – May 2023  
Bangladesh

B.Sc. in Computer Science and Engineering

- **CGPA:** 3.53/4.00 (3.61 in final term) | 3.86/4.00 in sessional courses (lab practicals and group projects)
- **Dean's List:** Level-2 for outstanding academic results
- **Relevant Coursework:** Machine Learning, High Performance Database Systems, Fault Tolerant Systems, Data Structures and Algorithms, Operating Systems, Computer Security

## Research

**ReAgent++: Runtime Detection of Aligned Backdoors in LLM Agents** Oct 2025 - Present  
(Research in progress)

- Designing novel backdoor detection system for LLM agents that complements consistency checks with STRIP-style runtime perturbation testing and K-Arm trigger-inversion scanning adapted for agent actions and text inputs

**An Empirical Study on Remote Code Execution in ML Model Hosting Ecosystems** March 2025 - Present

(Manuscript in progress; target venue: MSR 2026)

[Paper]

- Comprehensive analysis of remote code execution (RCE) vulnerabilities across 5 ML platforms with multi-phase empirical study including static analysis and developer discussion analysis; proposed security recommendations and developed automated vulnerability detection toolkit

**Multi-Agent Framework for Generating Relational DB Schema & ERD from Requirements** Aug 2025 - Present

(Work in progress)

- Extending SchemaAgent baseline with Dr. Sukarna Barua (BUET) through DSL-based communication protocol and hierarchical agent architecture for entity extraction, relationship mapping, and constraint validation to reduce schema generation errors

**Design by Contract for LLM APIs: Automated Enforcement and Runtime Remediation** Nov 2024 - Present

(Manuscript in Progress)

[Paper]

- Research collaboration with Dr. Akond Rahman (Auburn University) developing taxonomy for API contracts through empirical study of 412 real-world issues; created OpenAI SDK and LangChain extensions for automatic contract enforcement and runtime remediation

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

[Paper] [Website]

- Developed uReporter – Bangladesh's first anonymous reporting system during 2024 national crisis; analyzed 124 crowd-sourced reports using six transformer models with multilingual NLP pipeline for Bengali/Romanized Bengali, demonstrating anonymous crowd-sourcing's potential for understanding Global South socio-political dynamics

**Patient-Centric Blockchain Framework for Electronic Health Record Management** June 2022 – May 2023

(Undergraduate Thesis)

[Paper]

- Supervised by Professor ASM Latiful Hoque (BUET); designed blockchain framework with encrypted off-chain IPFS storage and on-chain Ethereum access control using ERC-721 based patient records with AES-GCM encryption, ECIES key wrapping, and EIP-712 signed permissions; evaluated on 10,000 synthetic patients

## Experience

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### Software Development Engineer 1, IQVIA – Dhaka, Bangladesh

June 2023 – Present

- Backend Engineer developing microservices-based healthcare applications handling millions of patient records using .NET Core, C#, and AWS
- Deployed Multi-Agent systems using LangGraph for dashboard generation/modification, integrated with data exploration agent achieving 85% reduction in setup time
- **Developed novel gap-based axis break algorithm** for data visualization, addressing outlier-threshold limitations and improving chart clarity
- Achieved 60% reduction in query execution times through database optimization; implemented 40% API response improvement via Redis caching
- Pioneered browser automation testing methodology in .NET, simplifying regression testing and improving test coverage from 72% to 95%
- Received IQVIA Impact Program – Silver award (May 2025) for outstanding performance

## Projects

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### Blockchain-Based Ticketing Platform

Jan 2021 - April 2021

- Finalist in Blockchain Olympiad Bangladesh (BCOLBD) 2021 with team "Recursively Enumerable"; designed NFT-based ticketing system using Ethereum and Polygon with ERC-1155 standard, smart contracts for anti-scalping, dynamic QR codes, and decentralized identity management with zero-knowledge proofs

### Production-Ready Database Engine in Go

Oct 2024 - Present

- Built complete database engine from scratch with B+ tree indexing, page management system with 8KB pages and LRU buffer pool achieving 2M ops/sec for reads, implementing ACID transactions with WAL, crash recovery using ARIES protocol, and concurrent access support

### Image Captioning with Attention Mechanisms

Jan 2023 – Feb 2023

- Implemented Show, Attend and Tell architecture with ResNet-101 encoder and LSTM decoder achieving BLEU-4: 0.335, CIDEr: 0.92 on MS-COCO; enhanced with beam search and multi-head attention achieving 11-point BLEU-4 improvement, with comprehensive ablation studies and attention visualizations

### Eventfly: End-to-end Event Management System

May 2022 - July 2022

- Designed microservices-based event management system with TypeScript, Express.js, Next.js, Docker, Kubernetes, NATS, and MongoDB; led back-end architecture implementing newsfeed, payment, authentication, and event management services

## Achievements & Awards

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- **IQVIA Impact Program – Silver Award** (May 2025) – Outstanding performance and essential feature development
  - **Finalist, Blockchain Olympiad Bangladesh 2021** – Top 40 teams nationally with "Blockchain Based Ticketing Platform"
  - **2nd place** in Bangla Handwritten Digits Recognition contest (95.9% accuracy) using custom CNN at BUET ML Lab (2022)
  - **Dean's List Award** for outstanding academic results in Level-2 of BUET
  - National prize winner in Bangladesh Physics Olympiad (2017) and Chemistry Olympiad (2017)
  - **Talentpool HSC Scholarship** – 15th in Rajshahi Board with 95.6% marks (2017)
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## Technical Skills

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- **Languages:** C#, Python, JavaScript, TypeScript, Go, SQL
- **Frameworks & Databases:** PyTorch, LangChain, LangGraph, .NET Core, ASP.NET, Express.js, FastAPI, PostgreSQL, MongoDB, Redis, SQL Server, DynamoDB
- **Cloud, DevOps & Blockchain:** AWS, Azure, Docker, Kubernetes, GitHub Actions, Terraform, OpenTelemetry, Jaeger, Ethereum, Solidity

## Test Scores

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