TAWHID AHMED

Full-Stack Software Engineer · AI / LLM | Python · FastAPI · LangChain · RAG · Spring Boot

tawhidahmed98@gmail.com | +880 1407 835375 | Dhaka, Bangladesh

Portfolio: tawhid-ahmed.pages.dev | LinkedIn: linkedin.com/in/tawhid-ahmed-3328941ab | GitHub: github.com/Tawhid-Ahmed

PROFILE SUMMARY

Full-stack software engineer focused on production **AI / LLM** systems, with over two years delivering enterprise platforms across **capital markets**, **cross-border payments**, and multi-tenant SaaS, and author of **a peer-reviewed journal article and a 2025 arXiv preprint**. Builds and owns embedded **LLM features** in **Python / FastAPI** (**tool-calling agents**, **RAG**, and streaming assistants) and ships them inside **Java 21 / Spring Boot** and **Vue 3** product stacks, from data access through API design to the UI.

TECHNICAL SKILLS

Languages: Python, Java 21, TypeScript, JavaScript, SQL

AI & ML: LangChain, LangGraph, RAG, FAISS, Chroma, Sentence-Transformers, OpenAI / Azure OpenAI, Groq, Ollama, MCP, tool-calling agents, prompt engineering, TensorFlow, PyTorch, Scikit-learn, OpenCV, Transformers (BERT, CNN, BiLSTM)

Backend: FastAPI, Pydantic, SQLAlchemy, Spring Boot 3, Spring Security / OAuth2 (JWT), REST APIs, Microservices

Frontend: Vue 3 (Composition API), Quasar, Pinia

Data & Messaging: PostgreSQL, Redis, RabbitMQ, WebSocket / STOMP

Cloud & DevOps: AWS, Docker, Docker Compose, Git, CI/CD, OpenAPI / SpringDoc

AI-Assisted Development: Cursor and Claude for pair-programming, refactoring, and test scaffolding, with human review before merge

PROFESSIONAL EXPERIENCE

Junior Software Engineer *Sep 2024 – Present*

Proficient Information Systems | Dhaka, Bangladesh

- **Own embedded AI / LLM features end to end** across three ongoing enterprise platforms — a task-management SaaS assistant, a capital markets OMS trading assistant, and a cross-border remittance wallet — working from model/tool design through FastAPI or Spring Boot services to the Vue 3 interface, with tests, API documentation, and code review throughout.

SuperCards — "Task AI Coach" In-App AI Assistant

Conversational assistant for a multi-tenant task-management SaaS that grounds an LLM in live backend data — giving management insight into task states and workload distribution, and helping individual users track and improve their own performance.

- Designed and built the assistant as a FastAPI + LangChain / **LangGraph** microservice that grounds LLM answers in live REST-API data through a **bounded tool-calling loop**, removing an entire class of hallucinated figures.
- Implemented **nine domain tools** behind a view-scoped registry so each page exposes only the relevant tools, with deterministic pre-LLM logic and scope labelling to keep reported totals accurate.
- Built **tenant-scoped RAG** for tag resolution using per-tenant vector indexes with hybrid literal and semantic retrieval, and shipped the chat widget with persisted per-view threads and server-driven charts.

  Stack: *Python, FastAPI, Pydantic, SQLAlchemy, LangChain, LangGraph, FAISS, Sentence-Transformers, Groq / Ollama, Laravel REST API, Vue 3, Quasar, Pinia, ApexCharts*

Capital Markets Order Management System (OMS) & Trading Platform

*Spring Boot microservices platform for Dhaka Stock Exchange brokerage operations, covering the full trading lifecycle: order entry, pre-trade risk controls, **FIX** exchange execution, and real-time market data.*

- Owned the platform's AI features: a **conversational trading assistant** with LLM tool-use over **MCP** and streamed responses, and per-symbol technical analysis computing 30-day RSI, SMA, and VWAP indicators.
- Developed order-lifecycle, client-management, and pre-trade restriction endpoints across the OMS and CAT services within a **nine-service microservices** architecture, and added message consumers handling execution reports and order-status events.
- Built the trading terminal front end — order entry, blotter, watchlist, and portfolio — streaming live order, execution, and market-data updates into the UI over **WebSockets**.

  Stack: *Java 21, Spring Boot 3, Spring Cloud, RabbitMQ, PostgreSQL, Redis, QuickFIX/J, STOMP WebSockets, OAuth2 / JWT, Azure OpenAI, MCP, Vue 3, Quasar, Pinia, Docker*

Cross-Border Remittance & Digital Wallet Platform

*Fiat ↔ USDC remittance platform integrating the Stellar blockchain and the MoneyGram anchor, backed by a **double-entry ledger** and a KYC compliance workflow.*

- Implemented REST endpoints and service-layer logic across the user, transaction, KYC, and ledger modules, contributing to a double-entry ledger with idempotent postings and a transaction state machine spanning 20+ deposit, withdrawal, transfer, hold, and reversal states.
- Built the MoneyGram deposit and withdrawal integration over **Stellar SEP-10 / SEP-24**, with scheduled jobs polling provider status and reconciling inbound USDC payments streamed from Horizon.
- Developed the wallet front end — authentication, dashboard, transactions, and KYC — including secure identity-document upload through backend presigned URLs.

***Stack:** Java 21, Spring Boot 3.5, Spring Modulith, PostgreSQL, Stellar SDK / Horizon, OAuth2 / JWT, Vue 3, TypeScript, Quasar, Pinia, Docker*

Programmer Intern *May 2024 – Aug 2024*

Proficient Information Systems | Dhaka, Bangladesh

- Built responsive web applications with Vue.js, Quasar, and JavaScript, improving UI performance and usability.
- Implemented features under senior review, debugged cross-device frontend issues, and took part in code reviews and team design discussions.

Industrial Trainee *Nov 2020*

BRACNet Limited | Dhaka, Bangladesh

- Completed a 15-day industrial training covering data-centre services, IoT, cybersecurity, ISP technology, and cloud applications.

EDUCATION

M.Sc. in Computer Science & Engineering *2023 – Present | CGPA 3.58*

Bangladesh University of Engineering and Technology (BUET) | Dhaka — coursework completed 2024; thesis on knowledge editing in vision–language models (in progress)

B.Sc. (Eng.) in Information & Communication Engineering *2017 – 2022 | CGPA 3.66*

Noakhali Science and Technology University (NSTU) | Noakhali

PUBLICATIONS

[1] *A Unified BERT-CNN-BiLSTM Framework for Simultaneous Headline Classification and Sentiment Analysis of Bangla News*, 2025. DOI: 10.48550/arXiv.2511.18618

[2] Ahmed, T., Uddin, M., Khan, M.A.R. and Hasan, A.R.M. *Offline Handwritten Character Recognition Including Compound Character from Scanned Document*. Asian Journal of Research in Computer Science, 14(4), 119–129, 2022. DOI: 10.9734/ajrcos/2022/v14i4297

AI / ML PROJECTS

arXiv RAG Assistant — Research Paper Q&A with Inline Citations github.com/Tawhid-Ahmed/Research_Rag

- Built a RAG service that ingests arXiv papers and answers questions with inline source citations, spanning a FastAPI backend, an ingestion pipeline (PDF parsing, token-aware chunking, embedding, vector indexing), a Streamlit chat interface, and a **pluggable LLM** provider layer covering OpenAI, Anthropic, Hugging Face, and local Ollama with SSE token streaming.
- Implemented **hybrid retrieval** combining BM25 sparse search with dense embeddings and a cross-encoder reranker, plus a guardrail that declines to answer when retrieval confidence is low.
- Built an **evaluation harness** reporting hit-rate, recall@k, and MRR across dense, hybrid, and reranked ablations; the codebase carries 18 pytest modules, ruff and mypy gates, and a Dockerised GitHub Actions CI pipeline.

***Stack:** Python, FastAPI, Streamlit, Sentence-Transformers, Chroma, BM25, Langfuse, Docker Compose, GitHub Actions, pytest*

Bangla OCR — Offline Handwritten Character Recognition github.com/Tawhid-Ahmed/Bangla-OCR

- Built an end-to-end deep-learning system for offline recognition of handwritten Bangla characters, including compound characters, covering image preprocessing, text segmentation, and **CNN-based classification**.
- Reached **~96% validation accuracy**, evaluated with precision, recall, F1-score, and confusion matrices.

***Stack:** Python, TensorFlow, Keras, OpenCV, NumPy, Pandas, Matplotlib, Scikit-learn*