

SHADRACK ITULAH

Software Engineer | MSc Computer Science

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EDUCATION

University of Hertfordshire

Hatfield, UK

Master of Science in Computer Science

EXPERIENCE

Software Engineer

2024 – 2025

Techinnover

- Architected and developed a production cinema booking platform using **Next.js**, **FastAPI**, and **PostgreSQL**, supporting 10,000+ monthly users with real-time seat availability updates through **WebSockets**.
- Designed and implemented **RESTful APIs** for authentication, seat allocation, payments, and booking workflows, integrating Stripe and supporting 1,000+ daily transactions.
- Optimized PostgreSQL queries using **SQLAlchemy** and introduced **Redis caching**, reducing API response times by 25% and improving performance across high-traffic application workflows.
- Designed containerized services with **Docker** and deployed applications on **AWS EC2**, implementing automated build, test, and deployment workflows with **GitHub Actions CI/CD**.
- Owned features from technical design through implementation, testing, code review, and production deployment; delivered 15+ features, participated in 130+ code reviews, and mentored 3 junior developers.

Full-Stack Engineer

2021 – 2024

Monomango (Web Development Agency)

- Built and deployed 8+ production applications using **React**, **TypeScript**, **Node.js**, and **PostgreSQL** across e-commerce, healthcare, and education products.
- **Integrated AI-powered search functionality** using vector embeddings and semantic search, improving search accuracy by 45% and user engagement by 30% through intelligent query understanding.
- Collaborated on **database schema design** and optimized complex SQL queries for high-traffic endpoints serving 100K+ monthly users, improving application responsiveness and scalability.
- Designed secure **RESTful APIs** with Express.js, implementing authentication, authorization, input validation, and reusable middleware for application services.
- Implemented Redis caching, automated testing with **Jest** and **Supertest**, and CI/CD workflows that reduced deployment time from 2 hours to 15 minutes.

FEATURED PROJECTS

DocRAG – Local-First RAG Knowledge | *FastAPI, PostgreSQL, Qdrant, Redis, Celery, Docker*

2026

- Architected a **local-first RAG platform** with project-isolated knowledge bases and asynchronous document ingestion pipelines, processing PDF, DOCX, PPTX, HTML, Markdown, and text files using **Celery**, **PostgreSQL**, S3-compatible object storage, and **Qdrant**.
- Implemented **hybrid information retrieval** combining dense semantic embeddings and BM25-style sparse search, merging ranked results with **Reciprocal Rank Fusion (RRF)** and applying cross-encoder reranking to improve retrieval relevance.
- Developed citation-aware RAG chat with **streamed responses**, metadata-filtered retrieval, page-level source attribution, and strict user/project retrieval boundaries to prevent cross-project data access.
- Built reliable ingestion and retrieval infrastructure with **Redis**, Server-Sent Events, database migrations, document cleanup across relational, vector, and object storage layers, and automated testing using **Pytest**, **Testcontainers**, **strict mypy**, and **GitHub Actions CI**.
- Integrated **BEIR-based retrieval evaluation** to benchmark dense, sparse, hybrid, and reranked search pipelines using standard information-retrieval metrics, enabling quantitative comparison of retrieval strategies and regression testing of search quality.

AI-Powered Data Analysis Platform | *Next.js, FastAPI, PostgreSQL, LangGraph, Docker*

2025

- Designed and built a full-stack data analysis platform using **Next.js**, **FastAPI**, and **PostgreSQL**, enabling users to upload structured datasets and execute natural-language analysis workflows through typed backend APIs.

- Implemented multi-stage analysis workflows with **LangGraph**, coordinating query interpretation, dataset inspection, analysis planning, code generation, execution, and response validation across reusable stages.
- Built a secure **Python execution sandbox** for generated analysis code, supporting Pandas-based transformations and Plotly visualizations while isolating execution from the core application.
- Containerized the application with **Docker** and implemented authenticated API access using JWT access and refresh token flows, separating frontend, backend, database, and execution responsibilities for reliable deployment.

TECHNICAL SKILLS

Languages: Python, TypeScript, JavaScript, SQL

Computer Science: Data Structures and Algorithms, Object-Oriented Design, Complexity Analysis, Operating Systems, System Design, Distributed Systems

Backend: FastAPI, Node.js, Express.js, REST APIs, WebSockets, Server-Sent Events, Celery

Databases: PostgreSQL, MongoDB, Redis, Qdrant

Cloud/DevOps: AWS (EC2, S3, Lambda), Docker, GitHub Actions, CI/CD

Testing: Pytest, Jest, Vitest, Testcontainers, Unit, Integration and End-to-End Testing

AI/Retrieval: RAG, Hybrid Search, Vector Search, Embeddings, Cross-Encoder Reranking, Ollama

CERTIFICATIONS

AWS Certified Cloud Practitioner

Amazon Web Services (AWS)

Machine Learning with Python

IBM

Deep Learning with Keras and TensorFlow

IBM

Advanced RAG with Vector Databases and Retrievers

IBM

Agentic AI with LangGraph, CrewAI, AutoGen and BeeAI

IBM