MOHAMMAD DEEN HAYATU

Software Engineer | Full-Stack Developer | AI/RAG Engineer

📷 mohammaddeen.hayatu@haydeentechnologies.com   📷 deenfortune89@gmail.com   🔗 LinkedIn   💻 Portfolio

🐙 GitHub

PROFESSIONAL SUMMARY

Software engineer with unique background in scientific research and bioinformatics, bringing disciplined, systems-level approach to building production-grade software. Specialized in full-stack development, AI/RAG systems, and cloud infrastructure with proven track record of delivering scalable solutions for healthcare, agriculture, and data analysis domains. Founded Haydeen Technologies to create impactful software solutions for West African industries. Strong foundation in data analysis, algorithm development, and systematic problem-solving from PhD research in genomics and bioinformatics.

TECHNICAL SKILLS

Programming Languages

- JavaScript/TypeScript
- Python
- C
- R
- Bash/Shell Scripting

Frontend & Backend

- React.js
- Node.js/Express
- HTML5/CSS3
- REST APIs
- PostgreSQL/MySQL

AI/ML & Data Science

- LangChain/LangGraph
- Ollama/Mistral 7B
- HuggingFace/CrewAI
- ChromaDB
- Machine Learning
- Bioinformatics

DevOps & Cloud

- AWS (EC2, S3, Elastic Beanstalk)
- Docker
- GitHub Actions
- Linux/Unix
- CI/CD Pipelines

Research & Analysis

- Next-Gen Sequencing (WGS, WES, RNA-seq)
- Genomic Data Analysis
- Statistical Analysis
- Information Retrieval

Tools & Platforms

- Git/GitHub
- VS Code
- Vercel/Netlify
- Postman

PROFESSIONAL EXPERIENCE

Founder & Lead Developer   *January 2025 - Present*

Haydeen Technologies

Remote

- Founded technology company delivering innovative software solutions for West African industries with focus on mobile-first, culturally appropriate design
- Leading development of AgriConnect platform connecting farmers, buyers, and suppliers with real-time weather data, marketplace features, and supply chain tracking

- Providing website design and development services to organizations including MPCGhana.org
- Architecting scalable full-stack applications using React, Node.js, PostgreSQL, and cloud infrastructure
- Implementing industry-specific solutions addressing real-world challenges in agriculture and healthcare sectors

Software Engineer
2023 - Present

Independent Projects

Remote

- Developed comprehensive Electronic Health Records system (GhEHR) for Ghana healthcare facilities with AI-powered clinical notes, offline capabilities, and real-time disease detection for malaria, typhoid, and TB
- Built multiple AI/RAG systems using LangChain, Ollama, and Mistral 7B for document analysis, data visualization, and natural language SQL queries with privacy-first, local-first architecture
- Created RAG Document Summarizer with multi-format support (PDF, DOCX, TXT), semantic search, and interactive Q&A using ChromaDB vector database
- Engineered Data Visual Agent converting natural language queries into publication-ready charts with automatic format detection and intelligent code generation
- Deployed production applications to AWS Elastic Beanstalk with Docker containerization and CI/CD pipelines
- Technologies: Node.js, React, TypeScript, Python, PostgreSQL, AWS, Docker, LangChain, Ollama

Doctoral Candidate - Bioinformatics & Genomics
April 2022 - Present

Universitätsklinikum Erlangen

Erlangen, Bavaria, Germany

- Conducting advanced research in chronic inflammatory skin conditions using cutting-edge sequencing techniques (WGS, WES, RNA-seq)
- Developing bioinformatics pipelines for genomic data analysis to identify genetic factors and pathways in skin inflammation
- Programming custom analysis tools in Python and R for large-scale genomic data processing and statistical analysis
- Integrating wet lab experimentation with computational analysis, bridging experimental and data science disciplines
- Building machine learning models for pattern recognition in genomic datasets

Student Research Assistant
March 2021 - September 2021

Universitätsklinikum Schleswig-Holstein

Kiel, Schleswig-Holstein, Germany

- Conducted laboratory experiments and data analysis for biomedical research projects
- Developed scripts for automated data processing and analysis workflows
- Collaborated with interdisciplinary research teams on molecular medicine projects

Biomedical Scientist
August 2017 - March 2018

Effiduase Government Hospital

Ghana

- Performed clinical laboratory tests and analysis for patient diagnostics
- Managed laboratory data and implemented quality control procedures
- Collaborated with healthcare professionals to provide accurate diagnostic results

KEY PROJECTS

GhEHR System - Electronic Health Records Platform

Node.js · React · TypeScript · PostgreSQL · AWS · Docker

Comprehensive EHR system for Ghana healthcare facilities featuring AI-powered clinical notes generation, offline-first architecture, patient management, appointment scheduling, and real-time disease detection algorithms. Deployed to AWS with Docker containerization.

🔗 [Live Demo](#) | [GitHub](#)

RAG Document Summarizer - AI-Powered Document Analysis

Python · Mistral 7B · Ollama · LangChain · ChromaDB

Document analysis system using Retrieval-Augmented Generation with locally-hosted LLM. Features multi-format support, semantic search, vector database integration, and interactive Q&A with complete privacy protection.

🔗 [GitHub](#)

Data Visual Agent - Natural Language Data Visualization

Python · LangChain · Ollama · Pandas · Matplotlib

AI agent transforming natural language queries into publication-ready visualizations. Supports CSV, Excel, JSON with automatic format detection, intelligent code generation, and chart customization.

🔗 [GitHub](#)

Local SQL Agents - Natural Language Database Queries

Python · LangChain · Mistral 7B · MySQL

Natural language to SQL converter using locally-hosted LLM. Features query validation, error handling, and complete data privacy for sensitive database operations.

🔗 [GitHub](#)

AgriConnect - Agricultural Platform for West Africa

React · Node.js · PostgreSQL · Mobile-First Design

Platform connecting farmers, buyers, and suppliers with real-time weather data, direct marketplace, supply chain tracking, and educational resources in local languages.

🔗 [GitHub](#)

EDUCATION

Doctor of Philosophy (PhD) in Molecular Medicine

Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

April 2022 - September 2025 (Expected)
Focus: Genomics, Bioinformatics, Machine Learning, Data Analysis

Master of Science (MSc) in Biomedicine

Christian-Albrechts-Universität zu Kiel, Germany

Focus: Molecular Biology, Bioinformatics, Statistical Analysis

Bachelor of Science (BSc Hons) in Applied Biology

University for Development Studies, Ghana

CERTIFICATIONS

RAG for Generative AI Applications Specialization

IBM via Coursera • November 2025

Comprehensive specialization covering GenAI fundamentals, RAG workflows, embedding models, similarity search, vector databases (Chroma DB, FAISS), and frameworks (LangChain, LlamaIndex). Built integrated interfaces using Gradio.

Build Multimodal Generative AI Applications

IBM via Coursera • October 2025

Proficiency in building multimodal AI applications integrating text, speech, images, and video. Leveraged Meta's Llama 4, OpenAI Whisper, and DALL-E. Deployed scalable workflows using Hugging Face, LangChain, Gradio, and Flask.

Advanced RAG with Vector Databases and Retrievers

IBM via Coursera • September 2025

Mastery of advanced retrievers in LangChain and LlamaIndex, semantic similarity search, HNSW algorithm, and building interactive RAG applications with multiple frameworks.

Generative AI Essentials

IBM via Coursera • September 2025

Fundamentals of Generative AI, capabilities, applications, and tools. Generated text, images, and code using various GenAI tools.

Vector Databases for RAG: An Introduction

IBM via Coursera • September 2025

Understanding of vector databases, similarity search, Chroma DB concepts, metadata filtering, full-text search, indexing, and building recommendation systems and RAG applications.

Build RAG Applications: Get Started

IBM via Coursera • September 2025

Built interactive RAG applications using LangChain and LlamaIndex with Gradio-based user interfaces. Compared frameworks for informed project decision-making.

Develop Generative AI Applications: Get Started

IBM via Coursera • September 2025

Fundamentals of GenAI applications and LangChain framework. Applied prompt engineering, in-context learning, prompt templates, chains, and agents. Developed GenAI web application with Flask.

Fundamentals of Building AI Agents

IBM via Coursera • September 2025

Developed AI agents with reasoning and autonomous task execution. Implemented tool calling and chaining for structured workflows. Applied best practices in prompt engineering and tool orchestration.

✓ AWS Fundamentals Specialization

✓ Python for Data Science, AI & Development

✓ Linux Commands & Shell Scripting Essentials

✓ R Programming

✓ Hands-on Introduction to Linux Commands and Shell Scripting

LANGUAGES

English (Native/Bilingual) • **Hausa** (Native/Bilingual) • **Twi** (Native/Bilingual) • **German** (Professional Working) • **Arabic** (Limited Working)