

Amaan Mohammed

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SUMMARY

AI/ML Engineer with production ML experience and a track record of building end-to-end LLM systems and RAG architectures that solve real problems. Communicates technical work clearly, a skill sharpened by teaching over 300 students as a graduate TA.

EXPERIENCE

Machine Learning Intern | CNPC USA | *Houston, TX*

June 2025– August 2025

- Built an **artificial neural network** to predict rate of penetration across **16K+ samples, 38 wells, and 14 lithologies**, improving R^2 from **0.66 to 0.76** over the production XGBoost baseline.
- Optimized network architecture, dropout, and learning rate using **Keras Tuner Bayesian Optimization** (60 trials x 500 epochs).
- Collaborated with domain experts to identify operationally meaningful features, **reducing feature space** from **52 to 21**, validated via permutation importance analysis.
- Developed a reproducible scikit-learn preprocessing pipeline using ColumnTransformer, categorical encoding, and feature scaling for consistent training and deployment.
- Benchmarked the residual ANN against Random Forest and XGBoost baselines using R^2 , RMSE, and MAE with parity plots.

Graduate Teaching Assistant | UMD | *College Park, MD*

January 2025– May 2026

- Led weekly hands-on lab sessions with live coding demonstrations across four consecutive semesters in Health Data Analytics, Data Science, and Data Sources & Manipulation.
- Taught and evaluated applied DS and ML concepts for **300+ students**, grading more than **6,000** coding and written submissions.
- Provided feedback on student implementations and technical communication to reinforce reliable programming and practices.

PROJECTS

CoverageCounsel – *Production RAG System* | [Live Demo](#)

August 2026

- Built and publicly deployed a Medicare coverage RAG assistant using hybrid BM25 and dense retrieval, cross-encoder reranking, and LangGraph query decomposition for multi-part questions.
- Achieved **RAGAS** scores of **0.838 faithfulness** and **0.932 answer relevancy** on an evaluation set of **42 questions**.
- Closed a privilege-escalation vulnerability that granted anonymous requests unrestricted access by enforcing role-based access control inside the retrieval query; validated the fix with automated tests asserting retrieved-document permissions.
- Grounded responses with inline citations and automated citation validation, using **Clerk OAuth** authentication and server-side **JWT verification** to protect user access.
- Deployed the application to Google Cloud Run with Docker and keyless GCP authentication; added LangSmith tracing and CI/CD evaluation gates to prevent deployments that failed quality checks.

BugSlayer – *AI SWE Agent* | [GitHub](#)

April 2026

- An agent that reads GitHub issues, generates code patches, and validates fixes in an isolated environment.
- Designed a **6-node LangGraph** pipeline replacing monolithic LLM calls with modular reasoning steps.
- Implemented a **ReAct-based** tool loop for code navigation, reducing irrelevant context retrieval by **~80% vs naive RAG**.
- Built a self-healing loop that injects live *pytest* failure traces as structured feedback and resets repository state **via Docker**, achieving **100% resolution** on benchmark issues.
- Instrumented observability via **LangSmith** tracing and human-in-the-loop validation with Streamlit.

OneStopJob (*2x Hackathon Winner*) | [GitHub](#)

March 2026

- Built a full-stack GenAI job automation platform (Next.js, TypeScript, Claude) processing job URLs into optimized applications.
- Orchestrated a **multi-stage LLM pipeline** with structured JSON constraints, prompt chaining, and safe parsing fallbacks.
- Reduced manual application effort from **15+ minutes** to under **60 seconds** via end-to-end AI automation.
- Integrated Hunter.io and GitHub REST APIs; deployed on **Vercel + Firebase** (Auth + Firestore).

SKILLS

- Programming:** Python, SQL, Go, TypeScript, R
- AI/ML:** PyTorch, TensorFlow, scikit-learn, XGBoost, Hugging Face, Random Forest, Keras, Neural Networks
- GenAI:** LangChain, LangGraph, LangSmith, ReAct, MCP, Tool Calling, Agent Harness
- RAG & Retrieval:** BM25, Dense Retrieval, Reranking, pgvector, FAISS, ChromaDB, RAGAS
- Deployment & Fullstack:** Next.js, Tailwind, FastAPI, Firebase, Vercel, AWS, GCP, Azure, Docker, CI/CD, Clerk, Supabase

EDUCATION

University of Maryland

College Park, MD

Master of Science in Applied Machine Learning

August 2024– May 2026

Vellore Institute of Technology

Amravati, India

Bachelor of Engineering in Computer Science (Minor in Artificial Intelligence)

August 2020– June 2024