Ekansh Bajpai

AI / ML Engineer – RAG, GraphRAG, LLM Systems
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PROFESSIONAL SUMMARY

AI/ML Engineer specializing in Retrieval-Augmented Generation (RAG), GraphRAG, and large language model (LLM) based systems. Strong experience in building end-to-end AI platforms including document ingestion, semantic search, knowledge retrieval, and cloud-native deployment. Background in signal processing, neural networks, and scalable backend systems. Currently pursuing an M.Sc. in Electrical Systems Engineering.

EXPERIENCE

Student Assistant – AI/ML & Full Stack Engineer   2024 – Present
Fraunhofer IEM
- Designed and developed backend microservices for AI-driven platforms using Python and FastAPI
- Implemented Retrieval-Augmented Generation (RAG) and GraphRAG pipelines for regulatory compliance and knowledge systems
- Built semantic search systems using vector embeddings with FAISS, ChromaDB
- Designed document ingestion, preprocessing, chunking, embedding, and indexing pipelines

Working Student – Frontend Developer   Feb 2023 – Sep 2023
NFDI4Culture
- Redesigned and implemented a new version of the Collana collation tool for cultural heritage research
- Developed modular frontend components using Angular, TypeScript, and Angular Material
- Improved UI consistency, accessibility, and maintainability across the application
- Collaborated in a distributed research-oriented development team

KEY PROJECTS

Normex – AI-Powered Regulatory Compliance Platform
- Designed an AI-driven compliance platform for document analysis and regulatory monitoring
- Implemented RAG-based semantic search using LangChain and OpenAI APIs
- Built document ingestion pipelines with batch processing and vector indexing
- Developed backend microservices using FastAPI, PostgreSQL, Docker, and AWS
- Implemented automated compliance reports and role-based access control

ASEC Backend – AI-Assisted Compliance Analysis
- Designed secure, API-centric backend aligned with Automotive SPICE guidelines
- Implemented LLM-powered document analysis and RAG pipelines over ISO and A-SPICE standards
- Enabled end-to-end traceability between projects, documents, and compliance analyses
- Built modular, containerized backend architecture for scalable deployment

sIEMi – Graph-Based Knowledge Management System
- Developed NLP pipelines to extract structured knowledge from unstructured text
- Modeled organizational knowledge using graph databases (Neo4j)
- Enabled expert discovery and intelligent knowledge retrieval using graph traversal

SKILLS

Programming: Python, JavaScript, TypeScript, Java, SQL
AI / ML: LLMs, RAG, GraphRAG, LangChain, OpenAI API, HuggingFace, Agentic AI, NLP
Backend: FastAPI, Django, Node.js, REST APIs, GraphQL
Databases: PostgreSQL, MongoDB, Redis, FAISS, Pinecone, ChromaDB, Neo4j
Cloud & DevOps: AWS, Docker, Kubernetes, CI/CD, GitHub Actions

EDUCATION

M.Sc. Electrical Systems Engineering   In Progress
University of Paderborn
Focus: Signal Processing, SLAM, Neural Networks, CNNs, SNNs

B.Tech Electronics & Communication Engineering   2019
Madan Mohan Malaviya University of Technology