ARKAPRABHA BANERJEE

AI ENGINEER

CONTACT

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Kalyani B1-317

Arkaprabha Banerjee

PROFILE SUMMARY

Passionate Data Scientist with expertise in Machine Learning, Deep Learning (CNN, RNN, LSTM, Transformers), and Backend Development. Skilled in Django, FastAPI, Flask, Python, and API Development. Experienced in Model Deployment, Data Analysis, and scalable system design. Active in building projects using TensorFlow, PyTorch, and SQL.

EDUCATION

2022-2026
HERITAGE INSTITUTE OF TECHNOLOGY

CSE(DATA SCIENCE)

- 1st Year : 8.9
- 2nd Year :8.5
- 3rd Year : 9.1(6th Sem)

10+2
D.A.V PUBLIC SCHOOL

- 10TH : 89%
- 12TH : 91%

SKILLS

- Neural Networks
- Model Deployment
- Backend Engineering
- Transformer Models
- MLOps
- Model Optimization
- Data Pipeline

LANGUAGES

- English: Fluent
- Hindi: Fluent
- Bengali: Fluent

PROJECTS

YOLO_END_TO_END – Object Detection with MLOps

- Developed an end-to-end object detection system using YOLOv5, covering all stages from data preprocessing to model training, evaluation, and deployment.
- Implemented MLOps practices with automated training pipelines, experiment tracking via MLflow, and a modular code structure for scalability and maintainability.
- Leveraged OpenCV for advanced image processing and Flask to deploy the model through a REST API for real-time inference.
- Tech Stack: Python, YOLOv5, OpenCV, Flask, MLflow.

RAG-Powered Multi-Agent Q&A Assistant

- Built a multi-agent system combining RAG and FAISS for efficient query routing, document retrieval, and response generation with Groq API and Llama 3 models.
- Designed a Streamlit web interface for seamless user interaction, reducing response time by 30%.
- Implemented LangChain document loaders and E5 embeddings for efficient document processing and semantic search.
- Increased retrieval precision by 25% with chunking and FAISS vector storage.

KRISHAK

- Agricultural AI Recommendation System | FastAPI, RAG, Twilio - Developed production-grade agricultural AI system using FastAPI with dual LLM integration (Google Gemini Pro + Groq Qwen), processing 10+ soil parameters across 36+ Indian states to generate personalized crop recommendations. Implemented Retrieval-Augmented Generation (RAG) pipeline with Qdrant vector database and sentence transformers achieving 85%+ recommendation accuracy while reducing farmer decision-making time by 70%. Built cost-effective SMS gateway with Twilio webhook integration supporting keypad phones, reducing communication costs by 80% through optimized coded input format with 3-second response time. Engineered robust data validation system with Pydantic models and geographic validation achieving 99.5% uptime, supporting real-time NPK analysis and fertilizer planning for enhanced crop yield optimization.